

Original Article

# Outcomes of Specialist Palliative Care Consultation for Patients with Advanced Cancer in an Oncological Emergency Department: A Retrospective Analysis

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## ABSTRACT

**Objectives:** Research on palliative care (PC) consultation and its outcomes in the emergency department (ED) within a low-and middle-income country (LMIC) setting is limited. This study aimed to evaluate PC consultation outcomes, symptom burden and management, and referral patterns in patients with advanced cancer referred for specialist PC (SPC) in the ED of an urban tertiary care cancer centre in India.

**Materials and Methods:** Data of adult advanced cancer patients referred for SPC services in the ED between August 2017 and June 2019 were retrospectively screened. Patients' sociodemographic features, clinical characteristics, ED visit-related data, and treatment-related data were documented. Multinomial logistic regression, incorporating significant univariate factors, was performed to analyse the independent predictive factors of consultation outcomes in the ED.

**Results:** Of the 644 consultations, 366 (56.8%) were discharged home, 166 (25.8%) were admitted to various settings (hospital/respite care/hospice), 74 (11.5%) died in the ED, and 38 (5.9%) were unresponsive upon arrival. Sex, performance status (PS), gastrointestinal and cardiovascular events, pain, cancer progression, and receipt of pharmacological treatment were predictive of consultation outcomes. Male patients and those with poor PS were more likely to be admitted to the ED, whereas patients with poor PS and cancer progression were more likely to die. Discharge rates were higher among females, those with gastrointestinal symptoms and pain, and those receiving pharmacological treatment.

**Conclusion:** More than 50% of the patients referred for SPC consultations were discharged. In addition, we also identified predictors for each consultation outcome in the LMIC-ED setting. Future research should investigate advanced care planning and survival analyses in comparable ED settings.

**Keywords:** Cancer, Emergency department, Palliative care, Outcomes, Symptom

## INTRODUCTION

Globally, there were 20 million new cancer cases in 2022, predicted to increase by 77% to 35 million by 2050.<sup>[1]</sup> In India, over 1.4 million people are diagnosed with cancer annually, expected to rise by 57.5% by 2040.<sup>[2]</sup> Advances in cancer treatment have extended the lives of those with advanced cancer, who often present to the emergency department (ED) due to multiple complex symptoms, inadequate symptom control, poor psychosocial support, or sudden health deterioration.<sup>[3]</sup>

Patients frequently exhibit uncontrolled symptoms,<sup>[4]</sup> psychological distress from fear and uncertainty about their disease,<sup>[5]</sup> and face challenges in accessing community

healthcare, particularly during acute symptom exacerbations outside regular hours.<sup>[6,7]</sup> Disease progression in end-of-life patients aggravates symptoms and urgent, life-threatening situations, prompting ED visits.<sup>[8]</sup> Previous studies report that 30–60% of cancer patients visit the ED in their last month of life<sup>[9–12]</sup> and 75% visit the ED in the last 6 months of life.<sup>[9]</sup> Chor *et al.* demonstrated that introducing palliative care (PC) in the ED is feasible and reduces symptom burden at the end of life.<sup>[13]</sup> Most patients preferred to die at home with good symptom control, and distressing symptoms could be managed in the ED, allowing patients to return home.<sup>[14,15]</sup> This also reduced the length of hospital stays post-ED admission.<sup>[16,17]</sup> Despite the proven benefits

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of PC in improving patient and caregiver outcomes, literature on its application in the ED, particularly in the context of urban tertiary cancer care hospitals in India and low-and middle-income countries (LMIC), is limited. Understanding the outcomes of PC consultations in the ED and the symptom burden of these patients is crucial for optimising care delivery, improving policies and guidelines, and optimising resource allocation, especially in resource-limited settings.

This study aimed to evaluate the outcomes of patients presenting to the ED for Specialist PC (SPC) consultation. In addition, we analysed the symptom profile and reason for visits to the ED to understand the interventions provided and factors associated with SPC consultation outcomes.

## MATERIALS AND METHODS

### Study design and setting

This was a retrospective cross-sectional observational study conducted at a university-affiliated tertiary care cancer teaching hospital. The Department of Palliative Medicine at our hospital registers approximately 8000 new patients annually, offering outpatient clinics, inpatient facilities, home care services, and a respite PC facility for short stays (7–10 days) located 10 km from the hospital campus to address PC needs holistically. Hospital-based palliative medicine services include 24-h ED coverage, where patients are triaged by ED nurses and managed by the palliative medicine trainee under consultant supervision. Some patients receive their first PC consultation through referrals from the treating oncologists to the ED. Our institutional referral criteria for SPC consultation in the ED include patients referred by a medical oncologist/radiation oncologist who have high symptom burden and complex physical/psychosocial needs, self-referred patients/local physician-referred patients who are symptomatic and require emergency investigations/interventions, symptomatic patients with palliative intent presenting out of hours in the hospital-seeking care.

### Study population

Our analysis included patients aged  $\geq 18$  years, diagnosed with advanced cancer, and referred to the ED for SPC services between August 2017 and June 2019. Patients with incomplete documentation were excluded.

### Study procedure

Electronic medical records and case record forms with prerecorded variables of patients presenting to the ED were reviewed. Patients' sociodemographic features, clinical characteristics, ED visit-related data, and treatment-related data were documented. Patients often have more than one symptom/primary complaint; thus, clinical diagnosis based on the chief complaint, as reported by the patient,

was recorded along with other complaints. Two abstractors independently reviewed the records.

### Outcomes of interest

The primary objective of our study was to understand the different outcomes of ED consultations and the factors predictive of these outcomes. The secondary outcomes assessed were symptom profile, reason for visit or reference to the SPC team, and understanding of the interventions provided for patients referred to the SPC team in the ED.

### Statistical analysis

Categorical variables were summarised as frequencies and percentages, whereas continuous variables were described using means and standard deviations or medians and interquartile ranges, depending on the type of distribution. Characteristics were compared among patients who died, those who were admitted, and those planned for discharge. Differences in proportions across outcome groups were analysed using Chi-square or Fisher's exact tests. Multinomial logistic regression, including significant univariate factors, was performed to analyse the independent predictive factors of consultation outcomes in the ED. Relative risk was estimated using odds ratios (ORs) with 95% confidence intervals (CIs). Patients declared dead at presentation were excluded from the regression analyses. Statistical significance was set at  $P < 0.05$ . All statistical analyses were performed using Statistical Package for the Social Sciences for Windows (version 29.0; IBM Corporation, USA).

This study adhered to the Strengthening the Reporting of Observational Studies in Epidemiology guidelines.<sup>[18]</sup>

## RESULTS

A total of 31,022 consultations for SPC services were recorded in palliative medicine outpatient clinics, inpatient facilities, and ED settings during the study period. Seven-hundred and twelve (2.29%) consultations were performed in the ED, of which 644 (2.07%) consultations referred for SPC fulfilled the eligibility criteria. 350 (54.3%) consultations in the ED comprised of those in the age group 41–60 years, and 332 (51.6%) were females. The most frequent diagnoses of patients referred for SPC in the ED were lung ( $n = 106$ , 16.5%), breast ( $n = 82$ , 12.7%), and hematolymphoid ( $n = 65$ , 10.1%). For 415 (64.4%) consultations, patients self-presented to the ED, while 159 (24.7%) consultations were for those referred by the primary treating oncology services. In 476 (74%) consultations, patients on presentation were planned for no further disease-directed treatment and best supportive care (BSC) only. A total of 454 (70.5%) consultations occurred on weekdays, and nearly half of them occurred during night hours ( $n = 321$ , 49.8%).

The median number of previous outpatient department (OPD) consultations before ED presentation was 1

(IQR = 3). Of the total consultations, 487 (75.6%) were already registered with SPC, while 157 (24.4%) were referred for SPC consultation for the first time in ED. Among these 157 first-time consultations, 89 (56.6%) were female patients. A total of 137 consultations (21.3%) were previously seen by the hospital-based home care team. Two hundred seventy-six consultations (42.9%) had received palliative chemotherapy in the last three months before the ED visit. A total of 355 consultations (55.1%) were already on opioids for pain or dyspnea management. The median oral morphine equivalent (OME) was  $30 \pm 38.75$  mg/day, with doses ranging from 2.75 to 240 mg/day. Forty-nine patients revisited the ED for a total of 69 consults (10.7%), with 37 patients (5.7%) revisiting within 30 days of the 1<sup>st</sup> ED consult. Detailed patient characteristics and demographics are presented in Table 1. The median Eastern Cooperative Oncology Group (ECOG) score at presentation was 3 (IQR = 1). The median number of symptoms was 1 (IQR = 1). Dyspnea ( $n = 237$ , 39.1%) was the most common presenting complaint for which SPC was sought, followed by gastrointestinal symptoms ( $n = 150$ , 24.8%) and pain ( $n = 149$ , 24.6%). Forty patients (6.6%) were admitted to the ED for >24 h. Pharmacological treatment was advised during 482 (79.5%) ED consultations. Forty of the 237 consults (16.8%) presenting with dyspnea were prescribed opioids in the ED for breathlessness management. Thirteen (2.1%) consults also received nonpharmacological treatment. Blood investigations, imaging, and procedures were advised in 329 (54.3%), 92 (15.2%), and 151 (24.9%) consultations, respectively. The details of the clinical profiles and medical interventions are summarised in Table 2.

### Outcome of SPC in ED consultations

Of the 644 consults, 38 (5.9%) were unresponsive on presentation to the ED and subsequently declared dead. A total of 366 (56.8%) consultations led to discharge, 166 (25.8%) were admitted to various settings (hospital/respite care/hospice), and 74 (11.5%) patients died [Table 3].

### Univariable analysis of factors predictive of the outcome of ED consultation

Significant univariable factors, as identified by the Chi-square test predictive of consultation outcome in the ED, were gender, performance status (PS) on presentation (ECOG), gastrointestinal events, cardiovascular events, cancer pain diagnosis, signs and symptoms of cancer progression, and pharmacological treatment received in the ED. A detailed description is provided in Table 4.

### Multinomial regression results of significant variables

Males had higher odds of admission (OR: 1.59; 95% CI: 1.08–2.36,  $P = 0.02$ ) than females, compared to patients who were discharged home. Patients with ECOG 4 and ECOG 3 had higher odds of admission (OR: 4.13; 95%CI: 2.32–7.36),

**Table 1:** Demographics and characteristics of patient consults ( $n=644$ ).

Characteristic	Number of consultations (n, %)
Age (years)	
18–40	141 (21.9)
41–60	350 (54.3)
>60	153 (23.8)
Sex	
Female	332 (51.6)
Male	312 (48.4)
Marital Status	
Married	554 (86)
Single	46 (7.2)
Widow(er)	36 (5.6)
Divorced/Separated	8 (1.2)
Primary Cancer Diagnosis	
Lung and mediastinum	106 (16.5)
Gynecological	86 (13.4)
Breast	82 (12.7)
Hepatobiliary and Pancreas	78 (12.1)
Head and Neck	74 (11.5)
Gastrointestinal	71 (11)
Haematolymphoid	65 (10.1)
Bone & Soft tissue	45 (7)
Urological	24 (3.7)
Central nervous system	11 (1.7)
Carcinoma of unknown primary	2 (0.3)
Source of referral	
Local general practitioner/self-referral	415 (64.4)
Hospital-based primary oncology services inpatient/OPD	159 (24.7)
Hospital-based palliative medicine inpatient/OPD	41 (6.4)
Respite palliative care	29 (4.5)
ECOG	
1–2	144 (22.3)
3	218 (33.9)
4	282 (43.8)
Day of presentation	
Weekday (Monday-Friday)	454 (70.5)
Weekend (Saturday-Sunday)	190 (29.5)
Time of ED presentation	
Morning (7 AM–12 PM)	124 (19.3)
Afternoon (12 PM–4 PM)	102 (15.8)
Evening (4 PM–8 PM)	97 (15.1)
Night (8 PM–7 AM)	321 (49.8)
Goals of care on ED presentation	
Best supportive care (BSC)	476 (74)
Early palliative care (EPC)	168 (26)
Previous registration under SPC	487 (75.6)
Number of previous OPD consults	
1–2	250 (38.8)
≥3	237 (36.8)
Enrolled under home care services	137 (21.3)

(Contd...)

**Table 1:** (Continued).

Characteristic	Number of consultations (n, %)
Number of previous home visits	
1-2	79 (12.3)
≥3	58 (9)
Previous treatment received in last 3 months	
None	109 (16.9)
Surgery	30 (4.7)
Radiotherapy	82 (12.7)
Chemotherapy	56 (8.7)
Immunotherapy	23 (3.6)
Palliative chemotherapy	276 (42.9)
Palliative radiation	83 (12.9)
Combined therapy	56 (8.7)
Only Best Supportive Care	39 (6)
Previous use of opioid analgesics	355 (55.1)
Tramadol	121 (34.1)
Tapentadol	69 (19.4)
Morphine	128 (36.1)
Fentanyl	36 (10.1)
Buprenorphine	1 (0.3)
Oral Morphine Equivalent (OME, in milligrams) (Median, IQR)	30±38.75
Number of repeat consults in the ED	69 (10.7)
Duration of ED revisits from 1 <sup>st</sup> ED visit	
<30 days	37 (5.7)
30-100 days	5 (0.8)
>100 days	7 (1.1)
ED: Emergency department, SPC: Specialist palliative care, OPD: Outpatient department, ECOG: Eastern Cooperative Oncology Group, IQR: Interquartile range	

$P < 0.001$  and OR: 2.24; 95% CI: 1.25-4.03,  $P = 0.007$ ) over patients with ECOG 1-2, relative to patients who were discharged. Patients who presented with the chief complaint of gastrointestinal symptoms (OR: 4.13, 95%CI: 2.32-7.36,  $p < 0.001$ ) and (OR: 2.24, 95%CI: 1.25-4.03,  $p = 0.007$ ) were less likely to be admitted than patients who were discharged. Patients with ECOG 4 and ECOG 3 had higher odds of death (OR: 29.38; 95% CI: 6.86-125.77,  $P < 0.001$  and OR: 5.83; 95% CI: 1.29-26.20,  $P = 0.02$ ) than patients with ECOG 1-2, relative to patients who were discharged. Patients who had signs and symptoms of cancer progression had higher odds of dying (OR: 2.16; 95% CI: 1.08-4.34,  $P = 0.02$ ) than patients who were discharged. Conversely, patients who received pharmacological treatment had lower odds of dying (OR: 0.32; 95% CI: 0.17-0.60,  $P < 0.001$ ). The details are presented in Table 5.

## DISCUSSION

Patients with advanced cancer in the ED frequently experience myriad physical, psychological, and spiritual

**Table 2:** Symptom profile and medical interventions of ED consultations ( $n=606$ ).

Characteristic	Number of consultations (n, %)
Number of symptoms on presentation	
1	410 (67.6)
2	139 (23)
≥3	57 (9.4)
Symptom profile	
Dyspnea	237 (39.1)
Gastrointestinal symptoms	150 (24.8)
Pain	149 (24.6)
Neurological symptoms	144 (23.8)
Bleeding	65 (10.7)
Fever	55 (9)
Fatigue	25 (4.1)
Urological symptoms	17 (2.8)
Sepsis	12 (2)
Other symptoms	36 (5.9)
Clinical Profile	
Respiratory events	
Pleural effusion	50 (8.2)
Cancer-related dyspnea	39 (6.4)
Superior vena caval obstruction(SVCO)	10 (1.6)
Chronic Obstructive Pulmonary Disease(COPD) exacerbation	5 (0.8)
Lymphangitis	1 (0.2)
Gastrointestinal events	
Ascites	25 (4.1)
Subacute Intestinal Obstruction(SAIO)	21 (3.5)
Constipation	3 (0.5)
Laxative abuse	1 (0.2)
Renal and Metabolic events	
Renal dysfunction	12 (1.9)
Dehydration	2 (0.3)
Diabetic Ketoacidosis	2 (0.3)
Hypoglycaemia	3 (0.5)
Electrolyte disturbances	
Hypercalcemia	13 (2.1)
Hypocalcemia	2 (0.3)
Hyponatremia	12 (2)
Hyperkalemia	5 (0.8)
Cardiovascular events	
Thromboembolism	14 (2.3)
Pericardial effusion	1 (0.2)
Heart failure	2 (0.3)
Anemia	6 (1)
Infection-related	
Pneumonia	53 (8.7)
Acute Gastroenteritis	18 (3)
Sepsis	10 (1.6)
Wound-related infection	6 (1)
Acute Respiratory Distress Syndrome(ARDS)	2 (0.3)

(Contd...)

**Table 2:** (Continued).

Characteristic	Number of consultations (n, %)
Neurological events	
Brain metastasis (Raised intracranial tension)	33 (5.4)
Delirium	17 (2.8)
Encephalopathy	13 (2.1)
Spinal cord compression	12 (2)
Bleeding/Hemorrhagic events	43 (7)
Pain	78 (12.8)
Miscellaneous	
Cancer progression	92 (15.2)
Procedure-related	12 (2)
Treatment-related complications	8 (1.3)
Anaphylaxis	1 (0.2)
Laboratory investigations	329 (54.3)
Imaging	92 (15.2)
Chest X-ray	49 (8.1)
Abdominal X-ray	8 (1.3)
Ultrasonography(USG)	9 (1.5)
Computed tomography scan	10 (1.6)
Magnetic resonance imaging	15 (2.5)
2D-Echocardiography	2 (0.3)
Procedures	151 (24.9)
Oxygen	33 (5.4)
Transfusion	24 (4)
Pleural Pigtail	23 (3.8)
Nasogastric tube(NGT) insertion	19 (3.1)
Intercostal drain(ICD) insertion	15 (2.5)
Foley's insertion	14 (2.3)
Ascitic tapping	10 (1.6)
Debridement	1 (0.2)
Medications used in ED	
Paracetamol	148 (24.4)
NSAIDS	4 (0.7)
Tramadol	43 (7)
Tapentadol	20 (3.3)
Morphine	38 (6.2)
Fentanyl	9 (1.5)
Hyoscine butyl bromide	43 (7)
Combination of analgesics	67 (11)
Antibiotics	31 (5.1)

ED: Emergency department, NSAIDS: Nonsteroidal anti-inflammatory drugs

distress, necessitating PC consultations with varied outcomes. Among 644 SPC consultations at a tertiary care cancer centre in India over 22 months, 366 (57%) resulted in discharge, while 166 (26%) led to hospital, hospice, or respite care admissions. Seventy-four patients (11.5%) died. Male patients and those with poor PS were more likely to be admitted than those in the discharge group. Patients with poor PS and cancer progression were more likely to die in the ED. Female patients, those with gastrointestinal symptoms

**Table 3:** Outcome of ED consultation (n=606).

Outcome	Number of consultations (n, %)
Discharge	366 (56.8)
Admission	166 (25.8)
Tertiary Oncology Hospital	83 (12.9)
General Hospital	37 (5.7)
Respite Palliative Care facility	32 (5)
Hospice	14 (2.2)
Death	74 (11.5)

ED: Emergency department

and pain, and those receiving pharmacological treatment had higher discharge rates. The most common presenting symptoms were dyspnoea, gastrointestinal issues, and pain. During our 22-month study period, we recorded 31,022 SPC consultations in palliative medicine at our high-volume urban tertiary cancer centre. Only 2% of 31,022 consults were ED consultations, significantly lower than the 21–29% reported in previous studies.<sup>[14,15]</sup> In an earlier study, 47% of PC consultations in the ED resulted in discharge.<sup>[19]</sup> In our study, more than half of the patients referred for SPC consults in the ED were discharged home, and more than 90% were discharged within 24 h. Earlier research has also shown that cancer patients visiting the ED required more admissions than noncancer populations.<sup>[20]</sup> Our admission rate was less than half that of a retrospective study by Dumnui *et al.*, in which 93(47%) cancer patients visited the ED.<sup>[19]</sup> These findings reflect appropriate interventions for patients assessed in both clinic and inpatient settings and timely management of presenting complaints in the ED, indicating appropriate utilisation of resources and effective ED-based PC interventions, respectively. Evidence regarding the mortality rate of advanced cancer patients receiving PC in the ED is conflicting. We found that 11% of patients died after PC consultation in the ED, while Monsomboon *et al.* reported a 23% mortality rate among advanced cancer patients receiving PC in the ED in Thailand.<sup>[21]</sup> Similarly, Workina *et al.*, in their prospective study of 338 cancer patients visiting the ED, reported an 18.9% mortality rate.<sup>[22]</sup> In contrast, a population-based Canadian cohort examining ED visits of cancer patients receiving chemotherapy, with only 50% having received PC earlier, reported only 0.3% deaths in the ED.<sup>[23]</sup>

We found that different factors affected the outcomes of SPC consultation. Various authors have established that poor PS is an indicator of admission and death in patients presenting to the ED, in both cancer and non-cancer.<sup>[19,21,22,24]</sup> We found similar findings regarding PS in our univariate and multivariate analyses.

We found that pain and gastrointestinal symptoms were more predictive of discharge than admission. Notably, while

**Table 4:** Univariable analysis of factors predictive of outcome of ED consultations (*n*=606).

Characteristic	Total patients ( <i>n</i> =606)	Discharge ( <i>n</i> =366)	Admission ( <i>n</i> =166)	Death ( <i>n</i> =74)	Chi-square	P-value
Age (years)						
18–40	136 (22.4)	86 (23.5)	33 (19.8)	17 (23)	1.76	0.77
41–60	329 (54.3)	200 (54.5)	89 (53.6)	40 (54)		
>60	141 (23.3)	80 (22)	44 (26.6)	17 (23)		
Sex						
Female	315 (52)	208 (57)	71 (42.8)	36 (48.7)	9.41	<b>0.009</b>
Male	291 (48)	158 (43)	95 (57.2)	38 (51.3)		
Primary cancer diagnosis						
Lung and mediastinum	101 (16.7)	54 (14.8)	35 (21.1)	12 (16.2)	24.20	0.23
Gynecological	82 (13.6)	55 (15)	19 (11.4)	8 (10.8)		
Breast	78 (12.8)	47 (12.8)	23 (13.8)	8 (10.8)		
Hepatobiliary and pancreas	71 (11.8)	42 (11.4)	19 (11.4)	10 (13.5)		
Gastrointestinal	67 (11)	39 (10.7)	15 (9.1)	13 (17.5)		
Head and neck	66 (10.8)	40 (11)	19 (11.4)	7 (9.5)		
Hematological	63 (10.4)	41 (11.2)	15 (9.1)	7 (9.5)		
Bone and soft tissue	42 (7)	27 (7.4)	10 (6.1)	5 (6.8)		
Urological	23 (3.8)	12 (3.2)	7 (4.2)	4 (5.4)		
Central nervous system	11 (1.8)	9 (2.5)	2 (1.2)	0 (0)		
Carcinoma of unknown primary	2 (0.3)	0 (0)	2 (1.2)	0 (0)		
ECOG						
1–2	139 (23)	118 (32.2)	19 (11.4)	2 (2.7)	80.54	<b>&lt;0.001</b>
3	214 (35.3)	140 (38.3)	58 (35)	16 (21.6)		
4	253 (41.7)	108 (29.5)	89 (53.6)	56 (75.7)		
Clinical profile						
Dyspnea	105 (17.3)	58 (15.8)	34 (20.5)	13 (17.6)	1.82	0.40
Cancer progression	92 (15.2)	43 (11.7)	30 (18)	19 (25.7)	8.98	<b>0.01</b>
Infection	89 (14.7)	48 (13.1)	28 (17)	13 (17.5)	2.91	0.23
Pain	78 (12.9)	63 (17.2)	10 (6)	5 (6.7)	14.41	<b>&lt;0.001</b>
Neurological events	75 (12.4)	48 (13.1)	21 (12.6)	6 (8.2)	0.78	0.67
Gastrointestinal events	50 (8.2)	41 (11.3)	7 (4.2)	2 (2.7)	10.79	<b>0.005</b>
Bleeding events	43 (7.1)	30 (8.2)	7 (4.2)	6 (8.2)	2.89	0.23
Electrolyte disturbances	32 (5.3)	18 (5)	11 (6.6)	3 (4)	0.92	0.63
Cardiovascular events	23 (3.8)	8 (2.1)	12 (7.3)	3 (4)	4.71	<b>0.09</b>
Renal events	19 (3.1)	9 (2.5)	6 (3.6)	4 (5.4)	2.98	0.22
Pharmacological treatment received	482 (79.5)	302 (82.5)	133 (80)	47 (63.5)	13.70	<b>0.001</b>
Type of consultation						
Previously registered with SPC	480 (79.2)	285 (77.9)	130 (78.3)	65 (87.8)	2.41	0.30
1 <sup>st</sup> consultation in the ED	126 (20.8)	81 (22.1)	36 (21.7)	9 (12.2)		
Goals of care on ED presentation						
Early palliative care	161 (26.5)	100 (27.3)	45 (27)	16 (21.6)	1.06	0.58
Best supportive care	445 (73.5)	266 (72.7)	121 (73)	58 (78.4)		
Previous home care consultation	127 (21)	72 (19.7)	38 (23)	17 (23)	0.92	0.63
Previously prescribed opioid analgesics	328 (54.1)	206 (56.3)	85 (51.2)	37 (50)	1.76	0.41

ED: Emergency department, ECOG: Eastern Cooperative Oncology Group, SPC: Specialist palliative care, \*Values in bold are statistically significant(<0.05).

dyspnoea was common in all three consultation outcomes—discharge (16%), admission (20%), and death (18%)—it was not a significant predictive factor for any outcome. Dyspnea, the most prevalent symptom, can be explained by the fact that lung cancer was the most common malignancy in our study population. Moreover, breathlessness in advanced cancer is usually associated with a high oxygen requirement,

prompting families to bring the patient to the ED. Addressing reversible causes in the ED can alleviate the symptom burden. Sex was a predictive factor for outcomes following PC consultations in the ED. The number of females was slightly higher than males in our study population (51% vs. 49%), but the outcomes following PC consultations differed considerably between the two groups. Females were more

**Table 5:** Multinomial logistic regression of significant univariate predictors of outcome of ED consultation.

Variables	Outcome of ED consultation			
	Admission versus discharge		Death versus discharge	
	(OR with 95%CI)	P-value	(OR with 95%CI)	P-value
Sex				
Female	Reference	-	Reference	-
Male	1.59 (1.08–2.36)	<b>0.02</b>	1.28 (0.74–2.21)	0.37
ECOG on presentation				
1–2	Reference	-	Reference	-
3	2.24 (1.25–4.03)	<b>0.007</b>	5.83 (1.29–26.20)	<b>0.02</b>
4	4.13 (2.32–7.36)	<b>&lt;0.001</b>	29.38 (6.86–125.77)	<b>&lt;0.001</b>
Gastrointestinal events				
No	Reference	-	Reference	-
Yes	0.39 (0.16–0.93)	<b>0.03</b>	0.25 (0.05–1.17)	0.07
Cardiovascular events				
No	Reference	-	Reference	-
Yes	2.57 (0.84–7.82)	0.09	2.10 (0.46–9.51)	0.33
Pain				
No	Reference	-	Reference	-
Yes	0.43 (0.20–0.89)	<b>0.02</b>	0.95 (0.35–2.56)	0.92
Cancer progression				
No	Reference	-	Reference	-
Yes	1.37 (0.80–2.34)	0.25	2.16 (1.08–4.34)	<b>0.02</b>
Pharmacological treatment received				
No	Reference	-	Reference	-
Yes	0.80 (0.49–1.32)	0.39	0.32 (0.17–0.60)	<b>&lt;0.001</b>

ED: Emergency department, ECOG: Eastern Cooperative Oncology Group, OR: Odds ratio, CI: Confidence interval, \*Values in bold are statistically significant(<0.05).

likely to be discharged than admitted, and males were at risk of admission or death. Fifty-seven per cent of the new ED consults were females, which can be attributed to the socio-cultural differences in the Indian subcontinent leading to delayed presentation of female patients to oncology or PC clinics, often leading to the first PC consultation being in the ED. Receipt of pharmacological treatment was predictive of discharge (82.5%). The patients who died received fewer pharmacological treatments (63.5%) than those who were discharged. A possible explanation is that patients who were actively dying were identified, and aggressive interventions were avoided.

Ninety per cent of patients had solid tumours, of which lung cancer was the predominant cancer, consistent with other studies.<sup>[20]</sup> Sixty-eight per cent of patients presented with only one symptom. The most common presenting symptoms were dyspnea, pain, gastrointestinal and neurological symptoms, and bleeding. Previous studies have reported similar symptoms in the ED presentations of patients with and without cancer.<sup>[20,22,24,25]</sup> Pain, the second most common symptom, was primarily attributed to breakthrough pain from cancer/disease progression, end-of-dose pain, and poor compliance to analgesics. Emphasis on and awareness of BTP medications and their usage may help reduce ED

visits. Most patients belonged to the 41–60 years age group, contrasting with other studies reporting a median age above 65 years.<sup>[19,21,24]</sup>

Sixty-five per cent of consultations involved patients either presenting independently or being referred by local physicians to the ED, indicating patient and caregiver awareness of seeking urgent care, even in resource-limited settings. Similar high self-referral rates of 57% and 40% were reported by other authors.<sup>[20,24]</sup> Most of the consultations in our study were during weekdays, outside the standard working hours, which is contrary to those reported by many other studies,<sup>[14,21,22]</sup> likely due to the easy accessibility and lack of additional financial burden of availing ED services in our setting. Approximately three-quarters of our consultations were for patients only on BSC, likely because of their high symptom burden and poor PS associated with advanced cancers. However, the outcome of consultations was unaffected by the presence or absence of disease-modifying treatments and previous treatment modalities, highlighting a patient-centric approach to symptom relief in our practice. Laboratory investigations were advised for 54% and imaging for 15% of the SPC consults. Various procedures, including thoracic and abdominal paracentesis, oxygen supplementation, and transfusion of blood and blood products, were required in

15% of the patients. These rates contrast with studies with higher utilisation of procedures which can be explained by the regional and temporal differences in patient profiles during which their study was conducted.<sup>[14,21]</sup>

Approximately 55% of SPC consultations were on daily opioids, most often used for pain, followed by dyspnea. This reflects the practice of using opioids early in the course of symptom management, often to provide early relief. The median OME was 30 mg/day (IQR = 38.75). In a study conducted by LeBaron *et al.*, barriers related to prescribing opioids have been extensively discussed in the context of the Indian subcontinent.<sup>[26]</sup> Only 10.7% of consults accounted for revisits in the ED during the study period, which is less than the 18.4% in the study by Nordt *et al.*<sup>[24]</sup> This lower rate of ED revisits might be indicative of timely follow-up and the effectiveness of OPD and home-based consultations, thereby reducing the need for ED revisits.

Almost 60% of the patients enrolled in home care were discharged. However, 73.7% of consultations for patients unresponsive on presentation, were those living outside the limits of the city and suburbs, who needed access to hospital-based home care services and limited access to community-based PC clinics or home-care programs. This underscores the necessity for both the availability and training of local physicians in palliative and end-of-life care for advanced cancer patients. Sutradhar *et al.* also identified similar SPC access limitations, recommending further training for generalist palliative home care nurses.<sup>[27]</sup>

Our study had a few limitations. First, this was a retrospective study. We aimed to understand the prevailing standard practice of referrals to SPC in an oncology ED before designing any prospective or intervention study. Second, some variables of interest, such as documentation of the quality of life, comorbidities, discussions regarding advance care planning (ACP), preferred place of care, and death, were not routinely documented, limiting available information. Caregivers and family data were not documented, possibly because of the focus on urgent physical symptoms and management. We also did not document laboratory investigation results or their indications. Further prospective studies exploring these variables in a similar setting will add to the existing knowledge pool. Third, the ED staff did not use any triage tools, and all patients requiring SPC were referred according to standard care protocols. Fourth, this was a single-centre study, and the generalizability of our results to other settings should be explored further. Finally, mortality after ED consultation and survival analysis were not the primary focuses of our study.

## CONCLUSION

This is the first large-scale study, encompassing 644 SPC consultations, examining outcomes and factors associated

with SPC consultations for advanced cancer patients in an Indian oncological ED of a tertiary care cancer centre, reflecting real-world experiences in a low-resource setting. The most frequent outcome was discharge in 57%, followed by admission (26%). About 11.5% of patients died. PS, symptom type, sex, cancer progression, and pharmacological treatments predicted the outcomes.

Appropriate and timely management of symptoms leads to better patient care outcomes through the integration of palliative medicine in ED. Further research should focus on prospective studies of the use of triage tools, initiating conversations regarding ACP, and survival in the ED setting. The end-of-life care policy pertaining to the ED setting, specifically in a low-resource setting, is the need of the hour to streamline resources for optimising patient outcomes in the ED.

## Authors' contributions

SS, J.D, and SP: Conceptualisation, formulation of the research protocol, data acquisition, statistical analysis, and drafting of the original manuscript. All authors participated in the interpretation of the data and revision of the manuscript and have participated sufficiently in appropriate portions of the content. All authors approved the current version of the manuscript and have contributed sufficiently to be named as authors.

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## Ethical approval

The Institutional Ethics Committee (IEC) at Tata Memorial Hospital, Mumbai, reviewed and approved this study (OIEC/3709/2021/00002) and registered with the Clinical Trials Registry-India (ICMR-NIMS) (CTRI/2021/08/036000) on 27/08/2021. This study was conducted in accordance with the approved study protocol under standard regulations and the Declaration of Helsinki.

## Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

## Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the



writing or editing of the manuscript and no images were manipulated using AI.

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