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RESEARCH

Early Palliative Care and Quality of End-of-Life Care for People With Terminal Cancer, Victoria, 2018–2023: A Retrospective, Population-Based Cohort Study

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ABSTRACT

Objectives: To determine how many people who die of cancer in Victoria receive palliative care and early palliative care (more than 3 months before death); to assess the impact of early palliative care on the quality of end-of-life care.

Study Design: Retrospective, population-based cohort study; analysis of linked Victorian Cancer Registry data and routinely collected data for inpatient, non-admitted health service and emergency department care during the 12 months prior to death.

Setting, Participants: Victorian adults who died of cancer during 1 January 2018–31 January 2023.

Main Outcome Measures: Proportions of people who received palliative care (any time) or early palliative care (more than 3 months prior to death); likelihood of quality of end-of-life care measures: dying outside an acute hospital; chemotherapy, two or more emergency department visits, two or more hospital admissions during final 30 days of life; advance care plan at death.

Results: Of 53,305 people who died of cancer (mean age, 74.8 years [standard deviation, 13.0 years]; 29,527 men [55.4%]), palliative care was provided for 38,697 (72.6%); 17,409 people (32.7%) received early palliative care. The most frequent palliative care type was palliative approach to care (Z51.5 code; 33,974 people, 63.7%). The overall proportion of people who received palliative care did not change markedly during 2018–2022; the proportion who received early palliative care declined slightly, from 34.8% (95% confidence interval [CI], 33.6–35.9) to 33.0% (95% CI, 31.7–33.8). People who received early palliative care were more likely than people who received late palliative care to have an advance care plan (adjusted odds ratio [aOR], 1.46; 95% CI, 1.38–1.55) and to die outside hospital (aOR, 2.50; 95% CI, 2.37–2.64); they were less likely to have two or more of emergency department presentations (aOR, 0.75; 95% CI, 0.70–0.81), two or more hospital admissions (aOR, 0.58; 95% CI, 0.55–0.61) or chemotherapy (aOR, 0.51; 95% CI, 0.47–0.55) during their final 30 days of life.

Conclusion: 72.6% of people who died of cancer in Victoria during 2018–2023 had received palliative care, but only 33% had received it early. End-of-life care may be improved by providing palliative care early. The low early palliative care rate, despite the potential for improved outcomes for people who receive it, indicates that action is needed.

Cancer is a leading cause of death around the world [1]. Despite advances in treatment, large proportions of people with cancer experience distressing symptoms and deteriorating health in the final stages of their illness. Palliative care is consequently an essential component of comprehensive cancer management, aiming to alleviate suffering and to enhance the

Plain Language Summary

The known: Referring people with cancer to palliative care early is recommended to ensure that it effectively alleviates their suffering and enhances the overall quality of life for patients and their families.

The new: Early palliative care was associated with lower levels of poor quality end-of-life care, but only one-third of Victorian adults who died of cancer during 2018–2023 had received it.

The implications: Early palliative care should be provided for all people with terminal cancer, ideally commencing at the time the cancer is diagnosed.

overall quality of life and care for people with cancer and their families [2].

Several systematic reviews, meta-analyses and Australian studies have reported the benefits of integrating palliative care into cancer care early in the course of the illness. The benefits include better symptom management, quality of life and care satisfaction for patients; greater satisfaction with care and readiness to support and care for people with cancer among family members; and lower rates of acute hospital and emergency department presentations at the end of life [3–10]. The American Society of Clinical Oncology recommends referring people with cancer to palliative care, 'beginning early in the course of the disease, alongside active treatment of their cancer' [11]. The definition of early palliative care is inconsistent. In some randomised trials it has been defined as care initiated within 2 months of the diagnosis of advanced disease [12, 13]; it has been suggested in Victoria that it should be initiated more than 3 months before the death of the patient [14].

The importance of early initiation of palliative care for people with cancer is recognised, and Australia has one of the best palliative care systems in the world [15], but many people with cancer, including those with poor prognoses, do not receive palliative care according to the evidence for best care.

The aim of our study was to examine palliative care and early palliative care (more than 3 months before death) for people who die of cancer in Victoria. We sought to quantify whether rates of palliative care had improved during 2018–2023, and to identify patient groups for whom access should be improved. To expand the evidence base for effective palliative care in Australia, we assessed associations between receiving early palliative care and a range of standard measures of the quality of end-of-life care.

1 | Methods

We undertook a retrospective, population-based cohort study to examine end-of-life care for all Victorians who died of cancer during 1 January 2018–31 January 2023. We report our study in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines [16].

1.1 | Data Sources

We analysed Victorian Cancer Registry data for all adults (18 years or older) who died of cancer-related causes during 1 January 2018–31 January 2023. The data were linked by the Centre for Victorian Data Linkage (Victorian Department of Health and Human Services) to administrative hospital datasets of routinely collected data for inpatient, non-admitted health service and emergency department care during the 12 months prior to death. Health care use data included diagnoses and procedure codes, and health service use in all public and private hospitals and outpatient or community-based care in Victoria [17] (Table S1).

1.2 | Identification of Palliative Care

We used four identifiers of palliative care that were available in the administrative dataset: care type 'palliative care programme' or International Classification of Disease, tenth revision (ICD-10) code Z51.5 for inpatient palliative care, episode stream 41 or 1400 for community palliative care and episode stream 1300:1315 or 1600 for outpatient palliative care provided by a hospital-based palliative care consultancy team (Table 1).

1.3 | Outcomes

Two measures were used to categorise palliative care as any, early, late or none:

- Received palliative care (binary outcome): at least one of the palliative care identifiers versus none.

TABLE 1 | Identifiers of palliative care in the administrative datasets used.

Setting	Palliative care flag	Dataset	Identifiers
Inpatient	Palliative care bed	Admitted episodes (VAED)	Care type 'palliative care programme'
Inpatient	Palliative approach to care[a]		ICD-10 code Z51.5
Outpatient	Community palliative care	Non-admitted episodes (VINAH)	Episode stream 41, 1400
Outpatient[b]	Hospital-based palliative care consultancy team		Episode stream 1300: 1315, 1600

Abbreviations: ICD, International Classification of Diseases, tenth revision; VAED, Victorian Admitted Episodes Dataset; VINAH, Victorian Integrated Non-Admitted Health.

[a] That is, involves a hospital-based palliative care team consultation. Discussions with key stakeholders and analysis of inpatient and outpatient data suggest an overlap between hospital-based palliative care consultancy team and Z51.5-coded palliative care; all palliative care consultancy team events should have a palliative care Z51.5 code, but not all events with Z51.5 codes will have involved palliative care consultancy teams.

[b] Outpatient palliative care consultancy team event may also have Z51.5 codes in the inpatient dataset.

TABLE 2 | Characteristics of 53,305 adults who died of cancer-related causes in Victoria, 1 January 2018–31 January 2023.[a]

Characteristic	2018	2019	2020	2021	2022	Jan 2023	2018–2023
Number of patients	10,373	10,581	10,605	10,772	9874	1100	53,305
Age at death (years), mean (SD)	74.5 (13.1)	74.8 (13.1)	74.9 (13.0)	75.0 (12.9)	75.0 (12.9)	75.5 (12.5)	74.8 (13.0)
Age group at death (years)							
Under 60	1430 (13.8%)	1436 (13.6%)	1411 (13.3%)	1368 (12.7%)	1196 (12.1%)	106 (9.6%)	6947 (13.0%)
60–69	2062 (19.9%)	1976 (18.7%)	2004 (18.9%)	2008 (18.6%)	1769 (17.9%)	212 (19.3%)	10,031 (18.8%)
70–79	2892 (27.9%)	3027 (28.6%)	3028 (28.6%)	3122 (29.0%)	2862 (29.0%)	339 (30.8%)	15,270 (28.6%)
80–89	2940 (28.3%)	3019 (28.5%)	2982 (28.1%)	3110 (28.9%)	2935 (29.7%)	305 (27.7%)	15,291 (28.7%)
90 or older	1049 (10.1%)	1123 (10.6%)	1180 (11.1%)	1164 (10.8%)	1112 (11.3%)	138 (12.5%)	5766 (10.8%)
Sex							
Male	5705 (55.0%)	5923 (56.0%)	5932 (55.9%)	5886 (54.6%)	5486 (55.6%)	595 (54.1%)	29,527 (55.4%)
Female	4668 (45.0%)	4658 (44.0%)	4673 (44.1%)	4885 (45.3%)	4388 (44.4%)	505 (45.9%)	23,777 (44.6%)
Missing data	0	0	0	1	0	0	1
Birthplace							
English-speaking country	7596 (73.2%)	7715 (72.9%)	7639 (72.0%)	7750 (71.9%)	7142 (72.3%)	792 (72.1%)	38,634 (72.5%)
Other	2777 (26.8%)	2866 (27.1%)	2966 (28.0%)	3022 (28.1%)	2731 (27.7%)	307 (27.9%)	14,669 (27.5%)
Missing data	0	0	0	0	1	1	2
Indigenous status							
Indigenous	94 (0.9%)	102 (1.0%)	122 (1.2%)	107 (1.0%)	122 (1.2%)	11 (1.0%)	558 (1.0%)
Not Indigenous	10,279 (99.1%)	10,479 (99.0%)	10,483 (98.8%)	10,665 (99.0%)	9752 (98.8%)	1089 (99.0%)	52,747 (99.0%)
Tumour stream for cause of death							
Breast	618 (6.0%)	617 (5.8%)	624 (5.9%)	669 (6.2%)	573 (5.8%)	69 (6.3%)	3170 (5.9%)
Clinical haematology	966 (9.3%)	911 (8.6%)	959 (9.0%)	979 (9.1%)	952 (9.6%)	100 (9.1%)	4867 (9.1%)
Gastrointestinal, lower	1340 (12.9%)	1422 (13.4%)	1438 (13.6%)	1413 (13.1%)	1285 (13.0%)	124 (11.3%)	7022 (13.2%)
Gastrointestinal, upper	2064 (19.9%)	2045 (19.3%)	2098 (19.8%)	2163 (20.1%)	2020 (20.5%)	220 (20.0%)	10,610 (19.9%)
Genitourinary	1126 (10.9%)	1212 (11.5%)	1263 (11.9%)	1272 (11.8%)	1183 (12.0%)	136 (12.4%)	6192 (11.6%)
Gynae-oncology	503 (4.8%)	532 (5.0%)	498 (4.7%)	554 (5.1%)	481 (4.9%)	61 (5.5%)	2629 (4.9%)

(Continues)

TABLE 2 | (Continued)

Characteristic	2018	2019	2020	2021	2022	Jan 2023	2018–2023
Head and neck	302 (2.9%)	307 (2.9%)	317 (3.0%)	305 (2.8%)	275 (2.8%)	27 (2.5%)	1533 (2.9%)
Lung	2212 (21.3%)	2264 (21.4%)	2175 (20.5%)	2256 (20.9%)	2095 (21.2%)	223 (20.3%)	11,225 (21.1%)
Melanoma and skin	408 (3.9%)	391 (3.7%)	407 (3.8%)	315 (2.9%)	238 (2.4%)	36 (3.3%)	1795 (3.4%)
Neuro-oncology	354 (3.4%)	392 (3.7%)	384 (3.6%)	382 (3.5%)	360 (3.6%)	52 (4.7%)	1924 (3.6%)
Sarcoma	76 (0.7%)	78 (0.7%)	72 (0.7%)	79 (0.7%)	50 (0.5%)	15 (1.4%)	370 (0.7%)
Unknown primary	370 (3.6%)	388 (3.7%)	356 (3.4%)	361 (3.4%)	350 (3.5%)	36 (3.3%)	1861 (3.5%)
Missing data	34	22	14	24	12	1	107
Non-cancer medical conditions							
Yes	5524 (55.4%)	5661 (55.6%)	5474 (54.3%)	5698 (55.4%)	5061 (53.8%)	559 (53.5%)	27,977 (54.9%)
No	4456 (44.6%)	4518 (44.4%)	4615 (45.7%)	4579 (44.6%)	4341 (46.2%)	485 (46.5%)	22,994 (45.1%)
Missing data	393	402	516	495	472	56	2334

Abbreviations: ASGS, Australian Statistical Geography Standard; IRSD, Index of Relative Socio-economic Disadvantage; SD, standard deviation.

[a] A comprehensive table of characteristics (included any hospital use, marital status, requirement for interpreter, postcode-level socio-economic status an remoteness) is provided in Table S3.

- Received early palliative care: first received palliative care more than 3 months prior to death or within 6 weeks of diagnosis if the person died within 3 months of diagnosis. All other palliative care was defined as late palliative care.

Quality of end-of-life care indicators were based on those used in similar studies [18–20]:

- Site of death: hospital (acute care);
- Site of death: outside a hospital;
- Two or more emergency department presentations during final 30 days of life;
- Two or more hospital admissions during final 30 days of life;
- Acute hospitalisation with combined length of stay exceeding 14 days during the final 30 days of life;
- Inpatient chemotherapy during final 30 days of life; and
- Available advance care plan at death.

We also report the proportions of people with at least one or at least two of these indicators.

1.4 | Statistical Analysis

Using univariable and multivariable logistic regression, we assessed associations between any and early palliative care with quality of end-of-life care indicators and with age group at death, biological sex (male or female), marital status, residential postcode-based remoteness (Australian Statistical Geography Standard) [21] and socio-economic status (Socio-Economic Indexes for Areas [SEIFA] Index of Relative Socio-economic Disadvantage [IRSD] quintile) [22], primary language in country of birth (English or other), requirement for an interpreter in hospital, Indigenous status, private hospital use during the 12 months preceding death, cancer tumour stream (ICD-10 cause of death codes; Table S2), presence of one or more non-cancer medical conditions and year of death. These variables were selected to cover a broad range of socio-demographic, clinical need and geographic factors thought to influence access to palliative care [23]. The multivariable models included all variables in the analysis; we report adjusted odds ratios (aOR) with 95% confidence intervals (CI), and calculated and graphed adjusted predicted proportions of people who received any or early palliative care by tumour stream and year of death using the fitted regression model. Statistical analyses were undertaken in Stata 16.

1.5 | Ethics Statement

The St Vincent's Hospital Human Research Ethics Committee approved the study (LRR 221/20).

2 | Results

The Victorian Cancer Registry recorded 53,305 deaths of adults of cancer-related causes during 1 January 2018–31 January 2023. The mean age at death was 74.8 years (standard deviation, 13.0 years), 29,527 people (55.4%) were male and 14,669 (27.5%) were born in countries where English is not the primary language. The most frequent tumour stream was lung cancer (11,225 people, 21.1%); 27,977 people (54.9%) had at least one medical condition other than cancer (Table 2).

Palliative care was provided for 38,697 people (72.6%); 17,409 (32.7%) received early palliative care. The most frequent palliative care type was palliative approach to care (Z51.5 code; 33,974 people, 63.7%) (Table 3).

Any palliative care was more likely for younger than older people (under 60 years vs. 90 years or older: aOR, 2.88; 95% CI, 2.61–3.17), but early palliative care was less likely (aOR, 0.52; 95% CI, 0.47–0.58). Any palliative care (aOR, 1.07; 95% CI, 1.02–1.12) and early palliative care (aOR, 1.14; 95% CI, 1.08–1.20) were each more likely for women than men (Table 4).

The proportions of people who received any palliative care were largest for gynae-oncology (adjusted predicted rate, 81.4%; 95% CI, 79.8%–83.1%) and sarcoma (80.5%; 95% CI, 76.2%–84.8%) and smallest for clinical haematology (68.5%; 95% CI, 67.1%–69.8%). The proportions of people who received early palliative care were largest for unknown primary cancer type (73.7%; 95% CI, 71.0%–76.3%) and neuro-oncology (52.3%; 95% CI, 49.7%–55.0%) and lowest for clinical haematology (36.1%; 95% CI, 34.4%–37.8%), breast cancer (34.3%; 95% CI, 32.1%–36.4%) and melanoma and skin cancers (30.5%; 95% CI, 27.8%–33.0%) (Figure 1). The overall proportion of people who received palliative care did not change markedly during 2018–2022; the proportion who received early palliative care declined slightly, from 34.8% (95% CI, 33.6%–35.9%) to 33.0% (95% CI, 31.7%–33.8%) (Figure 2).

People who received palliative care were less likely than people who did not to have received chemotherapy during the final 30 days of their lives (aOR, 0.58; 95% CI, 0.54–0.62) and more likely to have had two or more emergency department visits (aOR, 1.49; 95% CI, 1.38–1.61) (Table 5).

People who received early palliative care were less likely than people who received late palliative care to have received chemotherapy (aOR, 0.51; 95% CI, 0.47–0.55), to have had two or more emergency department visits (aOR, 0.75; 95% CI, 0.70–0.81), to have had two or more acute hospital admissions (aOR, 0.58; 95% CI, 0.55–0.61), or to have had acute hospital stays totalling more than 14 days (aOR, 0.69; 95% CI, 0.64–0.73) during the final 30 days of their lives; they were more likely to have advance care plans at death (aOR, 1.46; 95% CI, 1.38–1.55) and to have died outside hospital (aOR, 2.50; 95% CI, 2.37–2.64). At least one indicator of poor end-of-life care was less likely for people who received early palliative care than those who received late palliative care (aOR, 0.47; 95% CI, 0.45–0.49) (Table 5).

3 | Discussion

Fifteen years ago, the landmark Temel study reported the benefits of early palliative care for people with metastatic lung cancer,

TABLE 3 | Palliative care received by 53,305 adults who died of cancer-related causes in Victoria, 1 January 2018–31 January 2023, by care type and year of death.

Characteristic	2018	2019	2020	2021	2022	Jan 2023	2018–2023
Number of patients	10,373	10,581	10,605	10,772	9874	1100	53,305
Palliative care	7590 (73.2%)	7794 (73.7%)	7665 (72.3%)	7799 (72.4%)	7067 (71.6%)	782 (71.1%)	38,697 (72.6%)
Palliative care type							
Admitted to palliative care bed	3941 (38.0%)	4229 (40.0%)	3942 (37.2%)	4052 (37.6%)	3720 (37.7%)	400 (36.4%)	20,284 (38.1%)
Palliative approach to care (Z51.5)	6786 (65.4%)	6926 (65.5%)	6612 (62.3%)	6812 (63.2%)	6157 (62.4%)	681 (61.9%)	33,974 (63.7%)
Community palliative care	2099 (20.2%)	2077 (19.6%)	2435 (23.0%)	2197 (20.4%)	1786 (18.1%)	171 (15.5%)	10,765 (20.2%)
Hospital-based palliative care consultancy team	2213 (21.3%)	2288 (21.6%)	2133 (20.1%)	1768 (16.4%)	1810 (18.3%)	226 (20.5%)	10,438 (19.6%)
Palliative care timing							
Early	3520 (33.9%)	3531 (33.4%)	3472 (32.7%)	3425 (31.8%)	3125 (31.6%)	336 (30.5%)	17,409 (32.7%)
Late	4070 (39.2%)	4263 (40.3%)	4193 (39.5%)	4374 (40.6%)	3942 (39.9%)	446 (40.5%)	21,288 (39.9%)
None	2783 (26.8%)	2787 (26.3%)	2940 (27.7%)	2973 (27.6%)	2807 (28.4%)	318 (28.9%)	14,608 (27.4%)

TABLE 4 | Associations of palliative care and early palliative care with patient characteristics for 53,305 adults who died of cancer-related causes in Victoria, 1 January 2018–31 January 2023: multivariable analyses.[a]

	Adjusted odds ratio (95% CI)	
Characteristic	**Palliative care versus no palliative care**	**Early versus late palliative care**
Age group at death (years)		
Under 60	2.88 (2.61–3.17)	0.52 (0.47–0.58)
60–69	2.41 (2.21–2.63)	0.55 (0.50–0.61)
70–79	2.07 (1.91–2.23)	0.55 (0.50–0.60)
80–89	1.62 (1.51–1.75)	0.76 (0.69–0.83)
90 or older	1	1
Sex (female)	1.07 (1.02–1.12)	1.14 (1.08–1.20)
Any private hospital use	0.68 (0.65–0.71)	0.60 (0.58–0.63)
Marital status		
Married	1	1
Widowed	0.90 (0.85–0.96)	1.17 (1.10–1.25)
Never married	0.97 (0.90–1.04)	1.21 (1.13–1.29)
Divorced/separated	1.09 (1.00–1.18)	1.25 (1.16–1.35)
Not stated	0.82 (0.71–0.95)	1.36 (1.16–1.60)
Born in English-speaking country	0.89 (0.84–0.95)	1.03 (0.98–1.10)
Interpreter required	1.40 (1.27–1.55)	1.02 (0.94–1.12)
Indigenous person	0.87 (0.71–1.08)	0.93 (0.75–1.14)
At least one non-cancer medical condition	1.03 (0.99–1.08)	1.09 (1.04–1.14)
Socio-economic status (IRSD quintile)		
1 (least disadvantage)	1	1
2	1.03 (0.97–1.10)	1.00 (0.95–1.07)
3	1.03 (0.96–1.10)	0.92 (0.86–0.98)
4	1.00 (0.94–1.08)	0.98 (0.92–1.05)
5 (greatest disadvantage)	1.01 (0.94–1.09)	0.91 (0.84–0.98)
Remoteness (ASGS)		
Major cities	1	1
Inner regional	1.00 (0.94–1.05)	1.14 (1.08–1.20)
Outer regional	0.83 (0.76–0.91)	1.10 (1.00–1.21)
Remote/very remote	1.05 (0.50–2.23)	0.51 (0.24–1.09)
Year of death		
2018	1	1
2019	1.06 (0.99–1.14)	0.99 (0.92–1.05)
2020	1.00 (0.94–1.08)	1.02 (0.95–1.09)
2021	1.00 (0.94–1.07)	0.95 (0.89–1.02)
2022	0.96 (0.89–1.04)	0.92 (0.85–0.99)
January 2023	0.96 (0.81–1.14)	0.90 (0.76–1.08)
Tumour stream		
Breast	1	1
Clinical haematology	0.70 (0.62–0.79)	1.09 (0.96–1.23)
Gastrointestinal, lower	1.03 (0.92–1.16)	1.54 (1.38–1.73)
Gastrointestinal, upper	1.24 (1.11–1.39)	1.88 (1.69–2.09)
Genitourinary	0.99 (0.88–1.12)	1.32 (1.17–1.49)
Gynae-oncology	1.44 (1.25–1.66)	1.22 (1.07–1.39)
Head and neck	0.93 (0.79–1.09)	1.20 (1.02–1.42)
Lung	1.13 (1.01–1.26)	1.94 (1.75–2.16)
Melanoma and skin	1.03 (0.89–1.20)	0.84 (0.71–0.98)
Neuro-oncology	0.97 (0.83–1.12)	2.16 (1.87–2.50)
Sarcoma	1.35 (1.01–1.82)	1.35 (1.04–1.76)
Unknown primary	1.02 (0.88–1.19)	5.66 (4.78–6.70)

Abbreviations: ASGS, Australian Statistical Geography Standard [21]; CI, confidence interval; IRSD, Index of Relative Socio-economic Disadvantage [22].
[a] Adjusted for all other variables in table. The unadjusted analyses are included in Table S4.

including improved survival [13]. We found that 72.6% of people who died of cancer in Victoria during 2018–2023 had received palliative care; however, only 35% of those who died in 2018 had received early palliative care, and 33% of those who died in 2022. Further, early palliative care was associated with improved end-of-life care; people who received early palliative care were 53% less likely than those who received late palliative care to have an indicator of poor quality of end-of-life care. Specifically, they were 2.5 times as likely to die outside hospital, 25% less likely to have two or more emergency department presentations and 42% less likely to have two or more acute hospital admissions

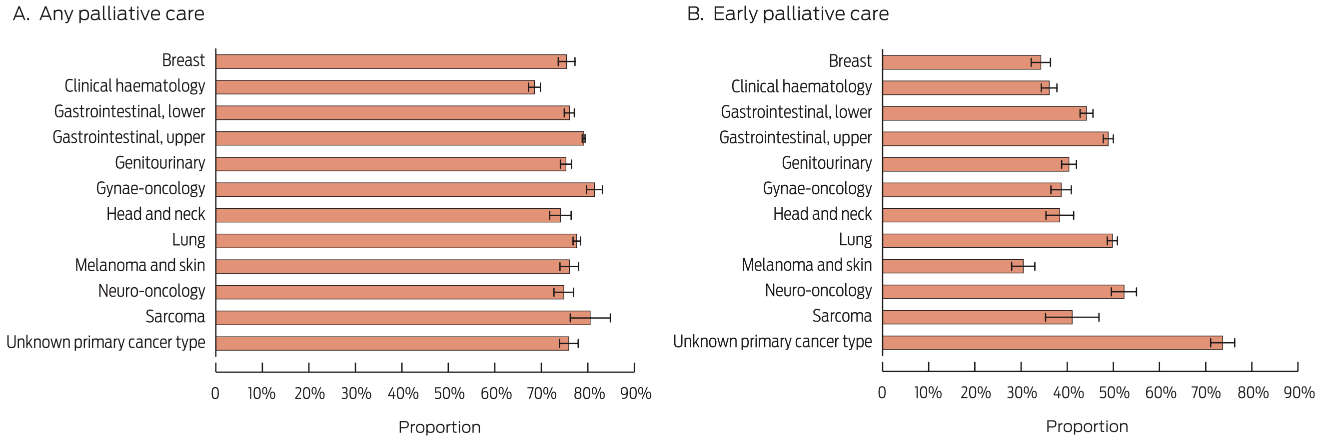

FIGURE 1 | Adjusted predicted rates (with 95% confidence intervals) of palliative care for 53,305 adults who died of cancer-related causes in Victoria, 1 January 2018–31 January 2023, by tumour stream (derived from the multivariable analysis reported in Table 4).

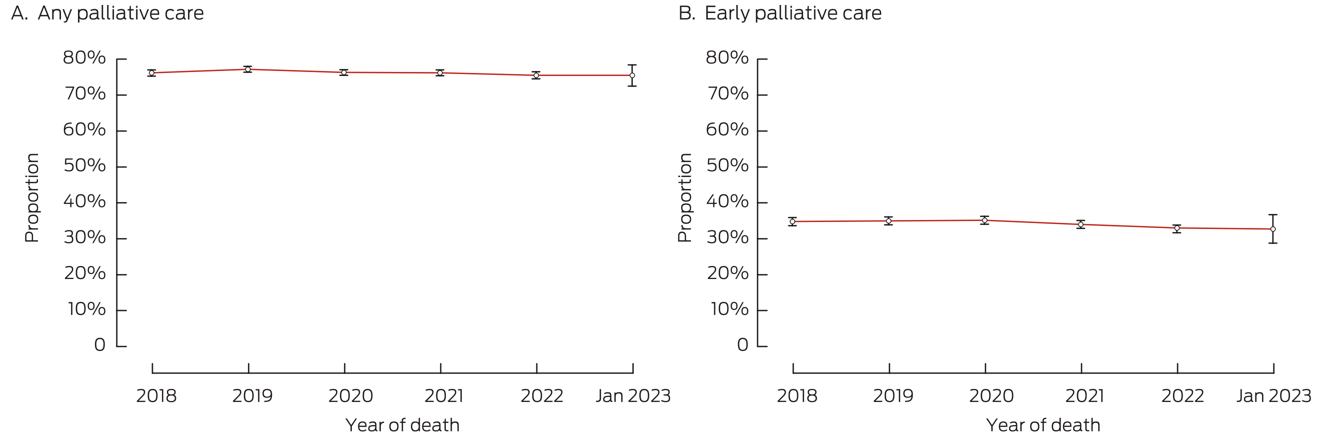

FIGURE 2 | Adjusted predicted rates (with 95% confidence intervals) of palliative care for 53,305 adults who died of cancer-related causes in Victoria, 1 January 2018–31 January 2023, by year of death (derived from the multivariable analysis reported in Table 4).

TABLE 5 | Association of palliative care and early palliative care with quality of end-of-life care indicators for 53,305 adults who died of cancer-related causes in Victoria, 1 January 2018–31 January 2023: multivariable analyses.[a]

	Adjusted odds ratio (95% confidence interval)		
Characteristic	**Palliative care versus no palliative care**	**Early versus late palliative care**	**Early versus no palliative care**
Died in hospital (acute care)	0.81 (0.77–0.84)	0.62 (0.59–0.65)	0.58 (0.55–0.62)
Died outside hospital	0.18 (0.17–0.18)	2.50 (2.37–2.64)	0.27 (0.26–0.29)
Final 30 days of life			
Two or more emergency department visits	1.49 (1.38–1.61)	0.75 (0.70–0.81)	1.25 (1.14–1.36)
Two or more acute hospital admissions	0.98 (0.93–1.02)	0.58 (0.55–0.61)	0.70 (0.66–0.75)
More than 14 days of acute hospital stay	1.26 (1.19–1.34)	0.69 (0.64–0.73)	0.99 (0.92–1.06)
Chemotherapy	0.58 (0.54–0.62)	0.51 (0.47–0.55)	0.38 (0.35–0.42)
Advance care plan at death	1.54 (1.44–1.64)	1.46 (1.38–1.55)	1.89 (1.76–2.03)
At least one indicator	1.71 (1.64–1.79)	0.47 (0.45–0.49)	1.13 (1.07–1.19)
At least two indicators	1.30 (1.25–1.36)	0.61 (0.58–0.64)	0.97 (0.92–1.02)

Abbreviations: aOR, adjusted odds ratio; CI, confidence interval; OR, odds ratio.
[a] Multivariable analyses adjusted for all variables in Table 4. The unadjusted analyses are included in Table S5.

during their final month of life and 1.5 times as likely to have an advance care plan. The low early palliative care rate, despite the potential for improved outcomes for people who receive it, indicates that action is needed.

Our analysis of 53,305 cancer deaths in Victoria during 2018–2023 provides a snapshot of the 72.6% of people who received palliative care during this period. We have previously reported that 59% of Victorians who died of cancer during 2000–2010 (29,680 deaths) [24] and 66% of those who died during 2018 (10,245 deaths) [25] had received palliative care. These findings suggest that the provision of palliative care has steadily increased since 2000. However, our new findings suggest that for most people it is confined to end-of-life care, as only about 30% of people received palliative care more than 3 months before they died. Even this definition of early palliative care could be inappropriately conservative for people with known incurable illnesses; the American Society of Clinical Oncology advocates commencing palliative care when the disease is diagnosed [11].

We found that the proportion of people who received early palliative care varied by socio-demographic characteristics and cancer type. The likelihood of receiving early palliative care declined with younger age, reflecting perceptions that palliative care is primarily a last resort for older people on their death beds [26, 27]. People with melanoma or skin or breast, or haematological malignancies were less likely to receive early palliative care than people with most other cancer types. Successful treatment or long term remission is more frequent for people with melanoma or skin or haematological cancers, and the role of palliative care as traditionally understood is uncertain. However, newer models of palliative care, embedded and delivered in parallel with acute and often intensive therapies, can be acceptable for patients and feasible and are associated with benefits for patients and health care teams [28–30]. Including palliative care as part of usual care would reduce the need to identify the best time for referring patients, as all people with diagnosed cancer would receive both holistic acute and palliative care [31].

Our findings regarding the benefits of early palliative care are consistent with those of published meta-analyses and systematic reviews [3–10]. However, randomised controlled trials have yielded mixed results [32, 33], probably reflecting methodological and contextual differences [3]. Trials are typically designed for specific settings and rarely have the statistical power to detect differences in costs or health care use [34]. Observational cohort studies such as ours have the advantage of capturing population-level data in a local context, providing insights directly relevant to Victoria. However, such designs establish associations rather than causal connections, and they can be subject to selection bias, confounding and reverse causality errors. For example, the relationship we found between receiving palliative care and fewer emergency department presentations could indicate that people are referred to palliative care after hospital admissions, rather than palliative care itself leads to changes in hospital use.

3.1 | Limitations

The magnitude of the impact of early palliative care on quality of end-of-life care may vary by the type and amount of palliative care received. The largest proportion by palliative care type in our study was a palliative approach to care, the code for which (Z51.5) is inconsistently applied [35]. Encouragingly, a recent Australian validation study found that a palliative approach to care was strongly associated with specialist palliative care input [36]. The expanding role of general practitioners in providing early cancer care [37] was not captured by the dataset. Finally, the study period spanned that of the coronavirus disease 2019 (COVID-19) pandemic, which may limit the generalisability of our findings. We found some indication of reduced palliative care being provided in hospitals in 2020 and 2021, offset by increased community palliative care (Table 3), consistent with other reports [38].

3.2 | Conclusion

Our study contributes to the body of evidence for the value of early palliative care for people with cancer. The challenge now is translating this evidence into practice. Central to providing such care is overcoming the uncertainty of clinicians about the optimal timing of referrals to palliative care by establishing clear, objective, easily recognisable transition points in the cancer care trajectory. This work is underway for five advanced cancer types: innovative new models of early palliative care, built on transition points developed by international expert Delphi consensus, are being implemented and evaluated at multiple sites [39]. These and further efforts, including investment and policy that expand both in-person and virtual capacity, will be required to transform the care of all people with advanced cancer, so that early palliative care becomes the norm rather than the exception.

Author Contributions

Chris Schilling: writing original draft and data analysis. **Anna Collins, Vijaya Sundararajan, Brian H. Le and Jennifer Philip:** conceptualisation of the project. **Olivia Wawryk:** data curation and data analysis. **Anna Collins, Olivia Wawryk, Vijaya Sundararajan, Brian H. Le and Jennifer Philip:** review, provide inputs and feedback on the writing.

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Disclosure

Not commissioned; externally peer reviewed.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data for this study will not be shared, as we do not have permission from the participants or ethics approval to do so. The de-identified data we analysed are not publicly available, but requests to the corresponding author for the data will be considered on a case-by-case basis.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Data S1:** mja270128-sup-0001-Supinfo.pdf.