

The use of emergency medical services for palliative situations in Western Cape Province, South Africa: A retrospective, descriptive analysis of patient records

C H Gage,¹ BTEMC, MPhil; B Spies,¹ MB ChB; K Crombie,² MB ChB, MMed; L Gwyther,³ MB ChB, PhD; W Stassen,¹ BTEMC, PhD

¹ Division of Emergency Medicine, Faculty of Health Sciences, University of Cape Town, South Africa

² Department of Medicine, Faculty of Health Sciences, University of Cape Town, South Africa

³ Division of Interdisciplinary Palliative Care and Medicine, Faculty of Health Sciences, University of Cape Town, South Africa

Corresponding author: C H Gage (caleb.gage@gmail.com)

Background. An estimated 56.8 million people require palliative care annually, while only 14% receive such care. This imbalance is particularly acute in low-to middle-income countries (LMICs), where up to 80% of patients requiring palliative care reside. To correct this imbalance, integration between palliative services and other disciplines has been recommended. While improved palliative care integration is a priority in the South African (SA) LMIC context, emergency medical services (EMS) and palliative care remain non-integrated. This has resulted in poor palliative situation management by EMS and a lack of research concerning their intersection.

Objective. To examine EMS use for palliative situations in the Western Cape (WC) Province of SA by describing frequency of intersection, patient characteristics and outcomes.

Methods. An observational, descriptive, retrospective patient record review was employed at two hospitals with palliative care services in the WC. All patient records of those who arrived at the hospitals between 1 January 2020 and 31 December 2020 via EMS conveyance leading to palliative care provision were included in the study.

Results. In total, 1 207 unique patients received palliative care services at both hospitals during the study period. Of these, 395 (33%) made use of EMS for hospital conveyance on 494 occasions. The median (range) patient age was 60 (20 - 93) years, and most transports involved male patients (54%, $n=265$). Family members were the primary caregivers in most instances (89%, $n=440$), dyspnoea was the chief complaint (36%, $n=178$) and cancer was the most frequent diagnosis (32%, $n=159$). The median length of hospital stay was 6 days, with most patients discharged home (60%, $n=295$).

Conclusion. EMS in SA frequently encounter palliative situations for symptoms that may be managed within their scope of practice. Consequently, it appears that EMS have an important role to fulfil in the care of patients with palliative needs. Integrating EMS and palliative care may result in improved palliative care provision and, therefore, EMS and palliative care integration would be beneficial in SA.

S Afr Med J 2023;113(11):e1136. <https://doi.org/10.7196/SAMJ.2023.v113i11.1136>

The World Health Organization (WHO) has noted an increasing global demand for palliative care owing to ageing populations and consequent increasing rates of non-communicable disease.^[1,2] Despite this growing demand, there has been an inadequate corresponding supply of palliative care services.^[1] Estimates indicate that 56.8 million people require palliative care annually, while only 14% receive such care.^[3] This imbalance is particularly acute in low-to middle-income countries (LMICs), where up to 80% of patients requiring palliative care reside.^[3,4] These increased LMIC palliative needs result from greater disease burdens, resource limitations and underdeveloped palliative care provision.^[3,4] To correct this imbalance, integration between palliative services and other disciplines has been recommended.^[5] One such developing area of integration is between palliative care and emergency medical services (EMS).^[6,7] The limited existing data suggest that up to 10% of EMS call-outs may involve palliative situations and, given this intersection, palliative care should be integrated within EMS systems.^[8]

Taking LMIC challenges, recommendations for cross-disciplinary palliative care integration and the intersection between EMS and palliative situations into account, the South African (SA) setting is pertinent. SA falls into the LMIC category and suffers a 'quadruple burden of disease' due to communicable diseases, particularly HIV and AIDS, high maternal and paediatric mortality rates, non-

communicable disease and injury.^[9] The ensuing chronic, life-limiting illnesses have resulted in an increased need for palliative care in the country, as noted by the SA Ministry of Health.^[10] Using mortality data alone, an estimated 0.52% ($n=286\ 000$) of the SA population require palliative care annually.^[11] Palliative care literature in the country has stated, 'to meet this need, additional services within the public health sector, including community and home-based care will need to be developed.'^[11]

SA previously supported a World Health Assembly (WHA) resolution to strengthen palliative care systems, making palliative care development a priority in the country.^[12,13] Accordingly, palliative care has been included as an essential service in the new National Health Insurance (NHI) proposal, and is considered a human right.^[13] Furthermore, progress has recently been made in SA palliative care integration, with cross-disciplinary training in some locations being provided to nurses, doctors, correctional service facility workers and traditional healers.^[11,12] One area in SA where palliative care remains non-integrated is within EMS systems.^[14] Currently, palliative care does not form part of SA EMS training, protocols or patient management, nor do palliative care systems make formal use of EMS to assist in palliative care provision.^[14] This results in poor management of palliative situations by EMS and represents an opportunity for enhanced palliative care provision within the country.^[14] Moreover,

there is a dearth of SA-specific research concerning EMS and palliative care. Therefore, the characteristics of patients managed in palliative situations by SA EMS are unclear, as is the extent of intersection between the two. The aim of this study, therefore, was to examine EMS use for palliative situations in the Western Cape (WC) Province of SA by describing the frequency of intersection, patient characteristics and outcomes. For the purposes of this study, 'palliative situation' refers to any incident involving the care of a patient with palliative needs.

Methods

Design

An observational, descriptive, retrospective patient record review was employed. This study was compiled according to the REporting of studies Conducted using Observational Routinely-collected health Data (RECORD) extension of the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) checklist.^[15]

Setting

The WC province of SA has a population of 7.3 million,^[16] accounting for ~12% of the total SA population.^[17] Like the rest of the country, the WC maintains two distinct healthcare systems: private and state.^[18] State healthcare is supplied by the government to all citizens, while private healthcare is accessible only to those with healthcare insurance. Currently, only 17% of the SA population (24% in the WC) hold healthcare insurance.^[19] State hospitals are divided into varying levels: district (level 1), regional (level 2) and tertiary (level 3).^[20] District hospitals are frequently the entry point into the healthcare system, as regional and tertiary facilities are often geographically distant. They offer 24-hour emergency departments (EDs) and basic outpatient, inpatient, diagnostic and therapeutic services. Patients requiring care beyond the capabilities of district hospitals are referred to regional or tertiary hospitals, which are larger and capable of more complex, specialist diagnostic and therapeutic procedures. Patient records from two state hospitals, one district and one tertiary, within the WC were used in the present study. Both facilities have established palliative care services.

Within the EMS sector, both private and state, out-of-hospital emergency care is provided using a paramedic-led rather than physician-led system.^[14] Currently, formal training at a higher education (HE) institute is required to register as an EMS provider. However, this was a relatively recent change and many providers with basic short-course qualifications remain registered.^[21] The HE courses range from 1 (basic) to 4 (advanced) years in duration. Owing to the relatively low number and unequal distribution of advanced EMS providers in the country, ambulances are largely staffed with basic providers, while advanced providers frequently operate alone in rapid response vehicles.

Sample and sampling

All patient records of those who arrived at the district and tertiary hospitals between 1 January 2020 and 31 December 2020 via EMS conveyance leading to palliative care provision were included in the study. Illegible patient records, duplicates and those missing data pertaining to the mode of hospital arrival were excluded. Patient records of those who were not both conveyed by EMS and recipients of palliative care were likewise excluded.

Patient variables were extracted from a combination of EMS, hospital palliative service and ED records, all of which were included within individual patient files at both hospitals. Patient files at the district hospital were available in a digital database to

which CHG was granted access. Patient files at the tertiary hospital were physically stored in the facility's records department; however, the palliative service and ED maintained digital databases. BS and KC were granted access to both the physical and digital records. They linked patients across the platforms with a heuristic that included unique hospital numbers, folder numbers, patient names and dates of birth.

Data were collected from November 2022 to February 2023 by CHG at the district hospital and BS and KC at the tertiary hospital. This was performed according to the recommendations of Gilbert *et al.*^[22] to improve accuracy and minimise inconsistencies:

- Training: data collectors were trained in the study aims, objectives and data extraction tool prior to the study.
- Case selection: well-defined protocols and inclusion and exclusion criteria were developed and applied to the patient records.
- Definitions: all variables analysed were precisely defined.
- Extraction tool: a standardised extraction tool was used to guide data collection and uniformly handle data that were conflicting, ambiguous or missing.
- Meetings: throughout the data collection process, frequent meetings were held among the research team to ensure consistency in data handling.
- Monitoring: LG, WS and CHG closely monitored data-extracting performance.
- Testing of inter-rater agreement: CHG re-extracted data from a random sample of tertiary hospital patient care records (10%), blinded to the extracted data of BS and KC. Findings were compared, and an inter-rater reliability (IRR) of 1.0, calculated using Cohen's kappa (κ), was achieved. Furthermore, the data extraction tool was piloted by CHG and BS prior to the study to enhance consistency.

Data were recorded and cleaned using Excel (Microsoft Corp., USA). No missing data techniques were employed.

Data analysis

An *a priori* data extraction tool developed by the research team, based on previous international studies,^[23,24] was used to extract the following variables:

- patient characteristics: age, sex, primary home caregiver, chief complaint, diagnosis
- outcome: length of stay, disposition.

Patient age was recorded in years. Sex was classified as male or female. Primary caregiver referred to the person(s) who mostly cared for the patient at home (e.g. family members or home palliative services).

Chief complaint referred to a patient's primary symptom upon EMS arrival. Diagnosis was the primary documented reason in the hospitals for the patient receiving palliative care. This was linked to the categories into which the palliative centres divided diagnoses: cancer, cardiovascular, respiratory, renal, hepatic, neurological, frailty/dementia, HIV/AIDS and other.

Length of stay was calculated from the time of hospital arrival to the time of final disposition, and was recorded in days. Disposition referred to patient outcome in terms of the following: discharged home, discharged to hospice, death or other.

Summary descriptive statistics (medians, ranges) were used to describe the numerical data: patient age, frequencies and length of stay. The remaining variables were analysed as categorical data. Data were analysed using SPSS Statistics for Windows version 28.0 (IBM Corp., USA).

Ethical approval

Ethical approval, including a waiver of informed consent, was gained from the University of Cape Town Faculty of Health Sciences Human Research Ethics Committee (ref. no. 589/2021). Institutional approvals were gained from both the district and the tertiary hospital.

Results

In total, 1 207 unique patients received palliative care at both hospitals from 1 January 2020 to 31 December 2020. Of these, 395 (33%) made use of EMS for hospital conveyance and were included in the study. During the course of the year, these patients were transported on 494 occasions, resulting in an average of 41 EMS transports of patients with palliative needs per month. Fig. 1 demonstrates case selection.

Table 1 summarises the characteristics of the palliative situations managed by EMS. The characteristics were calculated based on number of EMS transports, unless otherwise specified, as the aim of the study was to examine EMS use for all palliative situations, which included repeat patient presentations. The median (range) patient age was 60 (20 - 93) years, and most transports involved male patients (54%, $n=265$). Family members were the primary caregivers in most instances (89%, $n=440$). Dyspnoea was the most common chief complaint (36%, $n=178$), and cancer was the most frequent diagnosis (32%, $n=159$). The median length of hospital stay was 6 days, with most (60%, $n=295$) patients ultimately discharged home.

Discussion

This study aimed to examine EMS use for palliative situations in the WC Province of SA by describing the frequency of intersection, patient characteristics and outcomes. This was to assist in filling the knowledge gap of EMS and palliative care intersection within SA. To our knowledge, this is the largest study to gather quantitative data on the subject in the country.

A previous qualitative study in SA gathered the perspectives of EMS providers on palliative care and found that these providers reported frequently encountering palliative situations.^[14] Because of this intersection, the providers viewed EMS and palliative care integration positively, elaborating on the role of EMS in palliative situations.^[14] The current study supports these findings as it indicates substantial and frequent intersection between EMS and palliative situations in the WC, with one-third of patients who received palliative care at the two hospitals in 2020 conveyed by EMS on 494 occasions throughout the year. High-income countries (HICs) have, likewise, found substantial intersection between EMS and palliative situations. A German study found palliative situations may represent up to 10% of EMS caseload.^[25] In Australia, a study found palliative situations comprised 0.5% ($n=4\ 348$) of annual EMS caseload.^[26] Within LMICs, and SA in particular, it has been argued that these percentages are likely higher owing to their increased burdens of disease.^[14] A further contributing factor within SA may

be a lack of personal transport options for patients, resulting in increased reliance on EMS to meet this need. Future research could quantify annual EMS palliative situation caseload in SA, including proportions of conveyance and non-conveyance.

Frequently documented chief complaints of patients with palliative needs for which EMS are called include dyspnoea, pain, convulsions and severe anxiety.^[8,27,28] We found dyspnoea (36%, $n=178$) and pain (16%, $n=80$) to be the most common chief complaints, while convulsions accounted for only a small percentage of cases (2%, $n=9$). While no cases of anxiety as a chief complaint were found, it may be that where such cases occurred, EMS providers were able to provide relief and these patients were not conveyed. Our findings are in line with several HIC studies in which dyspnoea and pain were likewise the most frequent chief complaints of palliative situations where EMS were called.^[23,24,26] Although this may indicate that EMS encounter similar palliative situations in both LMIC and HIC settings, variance in symptom aetiology and patient socioeconomic status is likely present, representing an area for further study.

Significantly, the management of dyspnoea and pain falls well within the scope of practice of EMS providers, who are trained in the management of these symptoms, including in SA. However, EMS providers are trained to manage dyspnoea and pain in emergency situations rather than palliative contexts. For example, while morphine, an essential palliative medication,^[29] is included in the scope of practice for advanced EMS providers in SA, it is not used in the management of severe dyspnoea in palliative situations. EMS providers are not trained in this application, and this indication does not explicitly form part of their scope of practice. Wiese *et al.*^[30] have recommended opioids be used for this purpose, demonstrating that dyspnoea in this population is significantly relieved with opioid administration by EMS providers. To achieve this benefit, EMS providers would require training not only in opioid administration for dyspnoea, but also in identifying which situations require a palliative approach to care, including family support and the use of non-pharmacological approaches.

A further benefit of EMS and palliative care integration described in the literature is the provision of home-based care without medical facility conveyance.^[31] Carter *et al.*^[24] demonstrated that provision of home-based palliative care by EMS improved patient and family quality of life, satisfaction and confidence. This in turn has potential

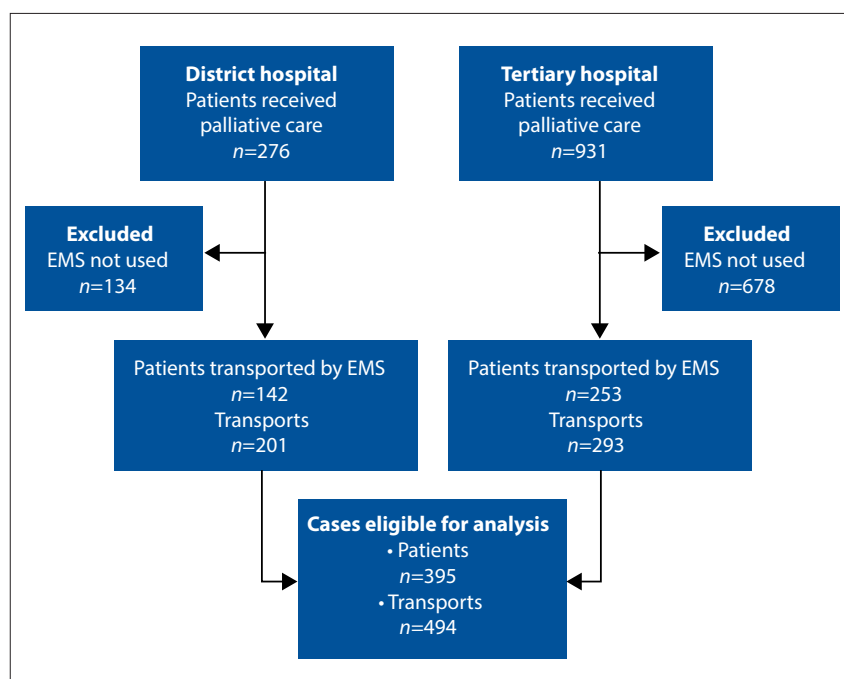


Fig. 1. Case selection. (EMS = emergency medical services.)

Table 1. Characteristics of palliative situations managed by EMS

Characteristic	District (n=201)	Tertiary (n=293)	Total (n=494)
Age (years), median (IQR)	60 (25)	61 (21)	60 (22)
Sex, n (%)			
Male	103 (51)	162 (55)	265 (54)
Female	98 (49)	131 (45)	229 (46)
Primary caregiver, n (%)			
Family	158 (79)	282 (96)	440 (89)
Home palliative service	4 (2)	0 (0)	4 (1)
Other*	39 (19)	11 (4)	50 (10)
Chief complaint, n (%)†			
Pain	47 (23)	33 (11)	80 (16)
Dyspnoea	98 (49)	80 (27)	178 (36)
Seizures	2 (1)	7 (2)	9 (2)
Trauma	2 (1)	2 (1)	4 (1)
Loss of consciousness	18 (9)	15 (5)	33 (7)
Cough	4 (2)	4 (1)	8 (2)
Body weakness	6 (3)	6 (2)	12 (2)
Vomiting	8 (4)	5 (2)	13 (3)
Other	16 (8)	50 (17)	66 (13)
Missing data	0 (0)	91 (31)	91 (18)
Length of stay (days), median (IQR)	5 (6)	9 (11)	6 (10)
Missing data	0 (0)	13 (4)	13 (3)
Diagnosis, n (%)			
Cancer	68 (34)	91 (31)	159 (32)
Cardiovascular	41 (20)	19 (6)	60 (12)
Respiratory	25 (12)	20 (7)	45 (9)
Renal	9 (4)	56 (19)	65 (13)
Hepatic	4 (2)	4 (1)	8 (2)
Neurological	11 (5)	28 (10)	39 (8)
Frailty/dementia	7 (3)	5 (2)	12 (2)
HIV/AIDS	21 (10)	6 (2)	27 (5)
COVID	6 (3)	44 (15)	50 (10)
Other	9 (4)	20 (7)	29 (6)
Disposition, n (%)			
Discharged home	145 (72)	150 (51)	295 (60)
Discharged hospice	1 (0.005)	26 (9)	27 (5)
Death‡	43 (21)	99 (34)	142 (29)
Other	12 (6)	6 (2)	18 (4)
Missing data	0 (0)	12 (4)	12 (2)

EMS = emergency medical services; IQR = interquartile range.

*Patients with 'other' primary caregivers include those with no specified caregiver and those with caregivers other than family or palliative care workers, such as a neighbour.

†Patients with 'other' chief complaints presented with a broad constellation of symptoms, including headache, dizziness, diarrhoea, constipation, anasarca and hypoglycaemia. The chief complaint 'trauma' refers to those who received palliative care after sustaining an injury (e.g. a fall).

‡Death represents a 'final outcome' and, therefore, percentages are higher when calculated based on unique patient numbers rather than EMS transports: district n=43 (30%), tertiary n=99 (39%), total n=142 (36%).

to decrease overall healthcare system costs by avoiding unnecessary hospital admission.^[23,32-34] Such integration may, likewise, enhance respect for patient autonomy, as the majority of patients with palliative needs may wish to die in the comfort of their homes rather than in a medical facility.^[35] Within SA, a study in Soweto found home to be the preferred place of death in 67% (n=126) of advanced cancer patients.^[36] These benefits would be valuable within the WC context as most hospital transports in our study ultimately resulted in discharge home (60%, n=295), many after only a brief 0 - 3-day stay in hospital (27%, n=129). With EMS and palliative care integration, many of these hospital transports may have been avoided.

Of concern in our study, 36% (n=142) of patients with palliative needs conveyed by EMS died in hospital, with an even higher proportion present in the tertiary hospital (39%). Clinicians in

district hospitals may be more likely to discharge patients home owing to greater knowledge of local home-care services and limited space in their facilities, whereas clinicians in tertiary hospitals may be more intervention focused and slower to refer patients to palliative care services. Several factors may have contributed to these high percentages of hospital deaths. Not all patients and their family members desire death in their home, and some may have chosen hospital conveyance regardless of outcome.^[36,37] Inadequate home-care resources in the area may contribute to these decisions, as a local medical facility may be the only place to receive care. Our data support this, with only 4 (1%) cases of palliative home care services identified as the primary source of care. Alternatively, insufficient patient, family or EMS knowledge of available home-care resources may likewise impact decision-making. From the EMS perspective,

there are system constraints that compel providers to convey patients to a medical facility, regardless of their wishes, particularly once medications have been administered or other care rendered.^[14] While the advanced EMS provider scope of practice within SA allows for the performance of an on-scene discharge to avoid unnecessary conveyance and keep patients at home, it is not currently used, as no policies or guidelines for its use exist. Whatever factors are involved, integration between EMS and palliative care would improve respect for patient autonomy, enhance homecare provision and avoid in-hospital deaths where patients wish to stay home. Such integration could make use of the existing SA EMS scope of practice, for example, opioid administration and on-scene discharge.

Healthcare in SA, as in other LMICs, suffers from budget and resource constraints in addition to its quadruple burden of disease.^[9] Consequently, medical facilities within the country, particularly state hospitals, regularly operate with patient numbers well above their capacity while being under-resourced. Avoiding unnecessary admissions and in-hospital deaths, and decreasing costs through EMS and palliative care integration, may represent an effective intervention to assist in alleviating these problems. In the USA, such integration has been successfully implemented with the use of specialist mobile hospice units working alongside EMS.^[38] Given the resource constraints of SA and other LMICs, the development of new systems may be too costly, and the integration of two existing systems (EMS and palliative), which frequently intersect, represents a logical and more efficient use of scarce resources. Simply improving communication between the two systems through telephonic consultations may be a cost-effective intervention.^[7,31] Alternative models of care, such as the community paramedic in Canada^[24] or extended care paramedic in Australia,^[2] which integrate palliative care, may be also more feasible within SA, and should be researched.

Limitations

This study is limited by its retrospective design. Furthermore, as this study was performed with patient records at two state hospitals in a single province of SA, its external validity is restricted both within SA and internationally. However, within SA it is likely that provinces share a similar intersection between EMS and palliative situations, as the quadruple burden of disease is ubiquitous. In addition, the real intersection across all provinces is likely greater, as our study only focused on two state hospitals and primarily involved state EMS. The private healthcare sector and those patients not conveyed by EMS, or with unmet palliative needs, were not observed. Owing to the COVID-19 pandemic, data collected in the year 2020 may be atypical, though only 10% of cases in this study involved a COVID-19 diagnosis. While the pandemic may have increased the number of patients with palliative needs conveyed by EMS, it is more likely the associated national 'lockdowns' resulted in fewer overall cases, as many patients avoided medical facilities.

Conclusion

SA suffers from a quadruple burden of disease resulting in an increased need for palliative care. While this need has been prioritised and palliative care is recognised as a human right, there are insufficient resources to adequately meet the demand, necessitating palliative integration with other services. While progress has been made integrating palliative care in SA with nurses, doctors and other allied healthcare workers, no integration exists with EMS systems. From our findings, EMS in SA frequently encounter palliative situations for symptoms that may be managed within their scope of practice. Therefore, it appears that EMS have an important role to fulfil in the care of patients with palliative needs. Integrating EMS and palliative

care may result in improved palliative care provision, respect for patient autonomy, decreased rates of unnecessary hospital admission and in-hospital death, and reduced overall healthcare system costs. These benefits are particularly germane to the SA context and, therefore, EMS and palliative care integration would be beneficial to the country.

Declaration. This study was performed as part of CHG's PhD in Emergency Medicine.

Acknowledgements. The authors would like to acknowledge and thank Dr Katya Evans and Dr René Krause for their invaluable guidance and expertise during the study, as well as Mrs Nwabisa Gage for her assistance in the creation of the data extraction tool.

Author contributions. CHG conceptualised the study, collected and analysed data, and drafted the manuscript. BS collected data and contributed to data interpretation. KC collected data and contributed to data interpretation. LG contributed to study design and data interpretation and acted as a co-supervisor for the project. WS conceptualised the study, contributed to data analysis and interpretation and acted as primary supervisor for the study. All authors critically reviewed the study and approved the final published version.

Funding. This study was funded by an institutional grant, held by WS.

Conflicts of interest. None.

- World Health Organization. Assessing the development of palliative care worldwide: A set of actionable indicators. Geneva: WHO, 2021. <https://apps.who.int/iris/handle/10665/345532> (accessed 29 May 2023).
- Juhrmann ML, Vandersman P, Butow PN, Clayton JM. Paramedics delivering palliative and end-of-life care in community-based settings: A systematic integrative review with thematic synthesis. *Palliat Med* 2022;36(3):405-421. <https://doi.org/10.1177/02692163211059342>
- Poudel A, Bhuvan KC, Shrestha S, Nissen L. Access to palliative care: Discrepancy among low-income and high-income countries. *J Glob Health* 2019;9(2):1-5. <https://doi.org/10.7189/jogh.09.020309>
- Van der Plas WY, Benjamins S, Kruijff S. The increased need for palliative cancer care in Sub-Saharan Africa. *Eur J Surg Oncol* 2020;46(7):1373-1376. <https://doi.org/10.1016/j.ejso.2020.03.212>
- World Health Organization. Palliative care. Geneva: WHO, 2020. <https://www.who.int/news-room/fact-sheets/detail/palliative-care> (accessed 29 May 2023).
- Gage CH, Stander C, Gwyther L, Stassen W. Emergency medical services and palliative care: Protocol for a scoping review. *BMJ Open* 2022;12:e062054. <https://doi.org/10.1136/bmjopen-2022-062054>
- Gage CH, Stander C, Gwyther L, Stassen W. Emergency medical services and palliative care: A scoping review. *BMJ Open* 2023;13:e071116. <https://doi.org/10.1136/bmjopen-2022-071116>
- Kamphausen A, Roese H, Oechsle K, et al. Challenges faced by prehospital emergency physicians providing emergency care to patients with advanced incurable diseases. *Emerg Med Int* 2019;20(19):211-11. <https://doi.org/10.1155/2019/3456471>
- Pillay-van Wyk V, Msemburi W, Laubscher R, et al. Mortality trends and differentials in South Africa from 1997 to 2012: Second National Burden of Disease Study. *Lancet Glob Heal* 2016;4(9):e642-653. [https://doi.org/10.1016/S2214-109X\(16\)30113-9](https://doi.org/10.1016/S2214-109X(16)30113-9)
- University of Pretoria. Palliative Care Resources. Pretoria: UP, 2017. <https://www.up.ac.za/media/shared/62/Palliative%252%0A0Care%2520Resources/final-npfsfc-august-2017.zp166876.pdf> (accessed 17 May 2019).
- Drenth C, Sithole Z, Cur B, et al. Palliative care in South Africa. *J Pain Symptom Manage* 2020;55(2):170-177. <http://doi.org/10.1016/j.jpainsymman.2017.04.024>
- Burger H, Krause R, Blanchard C, et al. Position paper on undergraduate palliative medicine education for doctors in South Africa. *Afr J Prim Health Care Fam Med* 2022;14(1):e1-e7. <https://doi.org/10.4102/phcfm.v14i1.3202>
- National Department of Health, South Africa. National Policy Framework and Strategy on Palliative Care 2017 - 2022. Pretoria: NDoH, 2017. <https://www.health.gov.za/wp-content/uploads/2020/11/NationalPolicyFrameworkandStrategyonPalliativeCare20172022.pdf> (accessed 29 May 2023).
- Gage CH, Geduld H, Stassen W. South African paramedic perspectives on prehospital palliative care. *BMC Palliat Care* 2020;19(1):153.
- Benchimol EI, Smeeth L, Guttman A, et al. The REporting of studies Conducted using Observational Routinely-collected health Data (RECORD) Statement. *PLoS Med* 2015;12(10):e1001885. <https://doi.org/10.1371/journal.pmed.1001885>
- Western Cape Government, South Africa. Population data. Western Cape Government: 2020. https://www.westerncape.gov.za/assets/departments/health/h_102_2020_covid-19_population_data.pdf (accessed 29 May 2023).
- South Africa. South Africa's people. South Africa, 2021. <https://www.gov.za/about-sa/south-africans-people> (accessed 29 May 2023).
- South Africa. Health. South Africa, 2022. <https://www.gov.za/about-sa/health> (accessed 29 May 2023).
- Statistics South Africa. General household survey 2021. Pretoria: Stats SA, 2021. <https://www.statssa.gov.za/publications/P0318/P03182021.pdf> (accessed 29 May 2023).
- Western Cape Government, South Africa. Hospital classification. Western Cape Government, 2023. https://www.westerncape.gov.za/dept/health/documents/public_info/W/19578?toc_page=#&:text=Level 1 - district hospitals where,Red Cross and Tygerberg hospitals (accessed 29 May 2023).
- Health Professions Council of South Africa. Emergency Care. Pretoria: HPCSA, 2023. [https://www.hpcsa.co.za/?contentId=0&menuSubId=45&actionName=Professional Boards](https://www.hpcsa.co.za/?contentId=0&menuSubId=45&actionName=Professional%20Boards) (accessed 29 May 2023).
- Gilbert EH, Lowenstein SR, Koziol-McLain J, et al. Chart reviews in emergency medicine research: Where are the methods? *Ann Emerg Med* 1996;27(3):305-308. [https://doi.org/10.1016/s0196-0644\(96\)70264-0](https://doi.org/10.1016/s0196-0644(96)70264-0)

23. Surakka LK, Peake MM, Kiljunen MM, et al. Preplanned participation of paramedics in end-of-life care at home: A retrospective cohort study. *Palliat Med* 2021;35(3):584-591. <https://doi.org/10.1177/0269216320981713>
24. Carter AJE, Arab M, Harrison M, et al. Paramedics providing palliative care at home: A mixed-methods exploration of patient and family satisfaction and paramedic comfort and confidence. *CJEM* 2020;21(4):513-522. <https://doi.org/10.1017/cem.2018.497>
25. Wiese CHR, Bartels UE, Marczyńska K, et al. Quality of out-of-hospital palliative emergency care depends on the expertise of the emergency medical team – a prospective multi-centre analysis. *Support Care Cancer* 2009;17(12):1499-1506. <https://doi.org/10.1007/s00520-009-0616-4>
26. Lord B, Andrew E, Henderson A, et al. Palliative care in paramedic practice: A retrospective cohort study. *Palliat Med* 2019;33(4):445-451. <https://doi.org/10.1177/0269216319828278>
27. Juhmann ML, Grindrod AE, Gage CH. Emergency medical services: the next linking asset for public health approaches to palliative care? *Palliative Care and Social Practice* 2023;17:1-11. <https://doi.org/10.1177/26323524231163195>
28. Waldrop DP, Clemency B, Lindstrom HA, Cordes CC. 'We are strangers walking into their life-changing event': How prehospital providers manage emergency calls at the end of life. *J Pain Symptom Manage* 2015;50(3):328-334. <http://doi.org/10.1016/j.jpainsymman.2015.03.001>
29. International Association for Hospice and Palliative Care. IAHP List of Essential Medicines for Palliative Care. Houston: IAHP, 2007. <https://hospicecare.com/what-we-do/projects/palliative-care-essentials/iahp-essential-medicines-for-palliative-care/> (accessed 29 May 2023).
30. Wiese CHR, Barrels UE, Graf BM, Hanekop GG. Out-of-hospital opioid therapy of palliative care patients with 'acute dyspnoea': A retrospective multicenter investigation. *J Opioid Manag* 2009;5(2):115-122. <https://doi.org/10.5055/jom.2009.0013>
31. Dent T, Tipping I, Anderson R, Daniels C. Hospice advice and rapid response service for ambulance clinicians. *BMJ Support Palliat Care* 2020;10(3):296-299. <https://doi.org/10.1136/bmjspcare-2019-001911>
32. Rosa A, Dissanayake M, Carter D, Sibbald S. Community paramedicine to support palliative care. *Prog Palliat Care* 2021;30(1):1-5. <https://doi.org/10.1080/09699260.2021.1912690>
33. Eaton-Williams P, Barrett J, Mortimer C, Williams J. A national survey of ambulance paramedics on the identification of patients with end of life care needs. *Br Paramed J* 2020;5(3):8-14. <https://doi.org/10.29045/14784726.2020.12.5.3.8>
34. Swetenham K, Grantham H, Glaetzer K. Breaking down the silos: Collaboration delivering an efficient and effective response to palliative care emergencies. *Prog Palliat Care* 2014;22(4):212-218. <https://doi.org/10.1179/1743291X13Y.0000000076>
35. Gomes B, Higginson IJ, Calanzani N, et al. Preferences for place of death if faced with advanced cancer: A population survey in England, Flanders, Germany, Italy, the Netherlands, Portugal and Spain. *Ann Oncol* 2012;23(8):2006-2015. <https://doi.org/10.1093/annonc/mdr602>
36. Ratshikana-Moloko M, Ayeni O, Tsitsi JM, et al. Spiritual care, pain reduction, and preferred place of death among advanced cancer patients in Soweto, South Africa. *J Pain Symptom Manage* 2020;60(1):37-47. <https://doi.org/10.1016/j.jpainsymman.2020.01.019>
37. Gysels M, Pell C, Straus L, Pool R. End of life care in sub-Saharan Africa: A systematic review of the qualitative literature. *BMC Palliat Care* 2011;10:6. <https://doi.org/10.1186/1472-684X-10-6>
38. Breyre A, Taigman M, Salvucci A, et al. Effect of a mobile integrated hospice healthcare program on emergency medical services transport to the emergency department. *Prehosp Emerg Care* 2022;26(3):364-369. <https://doi.org/10.1080/10903127.2021.1900474>

Accepted 29 September 2023.