

Health-related quality of life of palliative patients with cancer in South Africa and the Democratic Republic of Congo: a cross-sectional multi-centre study with matched European controls

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Abstract

Purpose

Assessing health-related quality of life (HRQoL) in patients receiving palliative care (PC) is an essential cornerstone in providing PC. Here, we aim to describe HRQoL of PC patients with cancer from South Africa (SA) and the Democratic Republic of the Congo (DRC).

Methods

This cross-sectional study assessed HRQoL using the EORTC QLQ-C15-PAL in PC cancer patients from SA and DRC. Data was merged with Austrian and Spanish patients serving as exploratory controls. We estimated the prevalence of clinically important problems using established thresholds and calculated odds ratios (OR). ANOVA and ANCOVA models (adjusting for age, sex, and comorbidities) investigated systematic score differences across countries and a general linear model investigated country-specific covariate interactions.

Results

We enrolled 103 patients (SA: n = 61, mean age 66.3; DRC: n = 42, mean age 55.1). Clinically important problems were highly prevalent: 68.9% of SA patients reported impaired physical function, and 95.0% of DRC patients reported clinically important pain. Compared to European controls, ORs for clinically important problems ranged from 0.7 for insomnia to 7.8 for constipation. Significant country-level differences persisted for physical functioning, pain, dyspnoea, and constipation ($p < 0.05$) after adjustment for covariates. Age, sex, and comorbidities showed country-specific associations with various HRQoL domains, including Emotional functioning, Global Quality of Life, Fatigue, Pain, Sleep Disturbance and Appetite loss.

Conclusion

High scores for symptoms that are typically considered manageable may indicate a need to improve palliative care services and support the advocacy for universally accessible PC solutions in SA and the DRC.

Introduction

In recent decades, the establishment of PC services have successfully been advocated for and implemented in various countries (1). Despite this global progress, the provision of PC remains fairly uneven across healthcare systems (2). In a recent review, barriers of accessing PC services in the countries of SSA were described as systemic barriers, financial barriers, and limited knowledge about PC services (3). Accordingly, a high level of unmet supportive care needs is reported for patients with cancer in SSA (4). Specifically in diverse patient populations, several challenges in accessing PC, such as different attitudes towards healthcare services, a potential lack of cultural sensitivity, or unmet informational needs, exist (5–7). To implement PC services in low-and-mid income countries, strategies, such as telemedicine, patient-navigator programs, as well as home-based care have been identified (8). It was shown that the provision of PC may reduce hospitalisation rates and hospitalisation durations (9) and therefore constitutes a cost-effective service in many healthcare systems, including low-and middle income countries (10, 11). Further, improved patient satisfaction, improved health-related quality of life (HRQoL) and improved attitude towards the disease were identified as benefits of providing PC in SSA (3).

One of the main aims of providing PC to patients with cancer is to improve and manage their HRQoL (12–14) whereby early integration of PC services has shown to improve symptom management and HRQoL of patients with cancer (15, 16). The World Health Organisation defines palliative care as “*an approach that improves the quality of life of patients – adults and children – and their families who are facing problems associated with life-threatening illness* (17)”. To systematically assess HRQoL in PC a variety of questionnaires, such as the EORTC QLQ-C15-PAL (18) were developed. HRQoL assessments have gained importance in patient-centred healthcare and research, whereby study endpoints focusing on HRQoL complement traditional outcomes such as survival

or disease progression (19). In routine clinical practice HRQoL assessments help to narrow the gap between patients' and health care professionals' view of health status and treatment success and help to improve care by meeting the patient's preferences and needs (20). Even in the context of advanced cancer settings, routine collection of HRQoL data has been shown to be feasible and to be associated with several clinical benefits including, fewer hospitalisations and superior quality adjusted survival (21).

Therefore, questionnaires like the EORTC QLQ-C15-PAL are increasingly being used for palliative patient monitoring in daily clinical practice (22). Particularly in PC settings, unique cultural perceptions around dying and death, as well as a variety of spoken languages add complexity in the optimal delivery of PC (23, 24). Initially, the EORTC QLQ-C15-PAL was developed relying on study participants of the countries Denmark, the Netherlands, Norway, Spain, Sweden and the United Kingdom (18). When performing HRQoL assessments in linguistically diverse countries, aspects of linguistic equivalence, interpretation and acceptability of the questionnaire language, should be accounted for (25). Thus, the cross-cultural adaptation and translation of PRO measures has been recommended in literature (26) to make the measures available for use in different countries and healthcare settings. In order to account for cultural aspects in the perception of health and to correctly reflect HRQoL data for certain target populations, the EORTC QLQ-C15-PAL was translated in more than 100 languages and validated in various cultural settings which reflect patient populations beyond Europe (27–29). While the authors are not aware of psychometric studies validating the EORTC QLQ-C15-PAL in countries of SSA, the “parent instrument” EORTC QLQ-C30 has previously been validated in SA patients with cancer (including advanced cancer stages) (30). Therefore, the use of the EORTC QLQ-C15-PAL still appears appropriate to perform HRQoL assessments in SSA palliative patients with cancer.

The aim of this study was to assess HRQoL of patients with cancer receiving PC in two SSA countries: SA and the DRC. We aimed to display the levels of functional health, and symptom burden of SSA PC patients with cancer while estimating the prevalence of clinically important problems according to previously established criteria(31). Additionally, we aimed to investigate whether systemic differences exist in the reporting of functional health and symptom levels of patients in SSA in comparison to European patients with cancer.

Patients and Methods

For this cross-sectional study, patients were enrolled at two centres in Cape Town, SA (St. Luke's Combined Hospices and Tygerberg Hospice) and at one centre in Lubumbashi, DRC (Ecole de Santé Publique, University of Lubumbashi). Recruitment in Cape Town took place between September 2024 until May 2025. Recruitment in Lubumbashi took place between March 2023 until August 2024. Patients in Cape Town were mainly assessed via mobile palliative care / home-based care services at the patients' homes. Patients in Lubumbashi were recruited in a total of eleven hospitals/clinics throughout the city of Lubumbashi. Eligibility criteria were a diagnosis of cancer, aged 18 years and above, and no serious cognitive impairment. Patients in SA had the option to choose between the questionnaire languages English, isiXhosa, or Afrikaans. Patients in the DRC were assessed via the French or Swahili versions of the questionnaires. The selection of questionnaire languages was based on the locally spoken languages. Participating patients were asked to fill out the EORTC QLQ-C15-PAL and answer sociodemographic questions. Clinical information was collected from the patients' self-reports, or from clinical charts where appropriate. Patients could either self-complete the questionnaires or provide answers via an interview format with the study team. Before commencement of the study, ethical approval for was obtained by participating institutions (UNILU/CEM/006/2023) and (SLCH_REC_03/2024). Written informed consent was obtained from study participants before assessments commenced. Results from Austrian and Spanish patients (i.e. European controls) from a previously published study with similar inclusion and assessment criteria(31) were merged with the prospectively collected sample in order to perform comparative assessment across the countries.

EORTC QLQ-C15-PAL

The EORTC QLQ-C15-PAL was developed as a shortened version of the most widely used PRO questionnaire the EORTC QLQ-C30 (18). It is designed to assess relevant aspects of HRQoL of patients with advanced and incurable cancer, while reducing the response burden of patients by answering a relatively short questionnaire (18). The psychometric properties of the EORTC QLQ-C15-PAL were deemed viable for the assessment of HRQoL in the palliative cancer patient population (27–29).

The questionnaire contains 15 questions, which comprise four multi-item scales (physical functioning, emotional functioning, fatigue, and pain) with two questions each, per each scale. Further five single items (nausea, dyspnoea, sleep disturbance, appetite loss, and constipation) assess additional symptoms, and one question refers to global quality of life (Global QoL). The functional health and the symptom questions are scored on a 4-point Likert scale assessing severity from “not at all” to “very much”. The Global QoL domain is scored on a seven-point scale ranging from “very poor” to “excellent” quality of life. Scores are then transformed into a 0-100 metric, whereby for functional health domains (physical and emotional functioning) and the QQL 100 points represent a high level of functioning, and for the symptom scales 100 points indicate a high symptom burden. Thus, when interpreting the scores the scoring directionality must be considered.

Statistical Analysis

Sample characteristics were presented as means, standard deviations, min-max values, and inter quartile ranges (IQR), separately for patients from SA and the DRC. Questionnaire scores were calculated according to the scoring manual (18), whereby individual patient scores were classified as “clinical important” or “clinically non-important” according to previously established scoring criteria (31) and the prevalence of clinical important symptom scores / functional health limitations was displayed for each SSA country. To contextualise the prevalence of clinical important problems, the prevalence of clinical important problems was further displayed for matched European patients and Odds Ratios of having a clinically important problem (SSA vs. European patients) were estimated. Matching to European controls was performed via case-control matching with a previously collected sample of palliative patients with cancer from Austria and Spain (31). Sociodemographic and clinical characteristics of the control population are described in the supplementary material. Matching was based on the variables age, sex, and the presence of self-reported comorbidities.

To investigate between country difference in HRQOL scores across the four countries we used an ANOVA. To investigate confounding-adjusted between country differences in HRQOL scores, we adjusted for the potential confounding variables, age, sex, comorbidities, cancer stage (as well as interaction terms for age*sex and age*comorbidity) using an ANCOVA. To investigate if country-specific effects of covariates on HRQOL scores exist, a general linear model (GLM) exhibits the effect of country, age, sex, and comorbidity as main effect as well as interaction terms for country-sex, country-age, and county-comorbidity on HRQOL scores. Partial eta squared (η_p^2) is calculated for the ANCOVA to display effect sizes of HRQOL scores for between-country differences, whereby the classification η_p^2 of 0.1 = small effect, η_p^2 of 0.06 = medium effect, and η_p^2 of 0.14 = large effect (32), was used to interpret effect sizes. The selection of covariates was based on the availability of variables in the respective data sets, as well on a-priori selection of sociodemographic and clinical variables, which were previously shown to impact HRQOL (33, 34).

As this study represents an explorative study, no previous power-calculation was performed to inform a sample size estimation. Statistical analysis was performed using IBM Statistics SPSS v30.0.

Results

In total 102 patients with cancer receiving palliative care were assessed in SA and the DRC. The mean age of SA patients was 66.3, whereby the average Congolese patient was 55.1 years respectively. In both cohorts, more than half of the patients were female (54.1% SA and 58.5% in DRC). In SA the majority of patients were interviewed at their homes (89.8%) while in the DRC a combined percentage of 97.5% were interviewed as in-patients or out-patients at hospitals or clinics. In both cohorts, breast (SA = 19.7%, DRC = 24.4%) and prostate (SA = 23.0%, DRC = 14.6%) cancer were frequently represented, whereby in SA patients with lung cancer (42.6%) and in the DRC also patients with other gynaecological malignancies (17.1%) were frequently assessed. ECOG Performance Status 1 was most frequently reported for patients in SA (34.4%), whereby ECOG Performance Status 3 was most frequently reported in the DRC (39.0%). Further sociodemographic and clinical information is presented in Table 1.

Table 1
Sociodemographic and clinical variables of palliative cancer patients (N = 102)

	South Africa (n = 61)		DRC (n = 41)	
	Mean	Min-Max; SD	Mean	Min-Max; SD
Age	66.3	36–88; 12.1	55.1	30–94; 14.6
	N	%	N	%
Sex				
Male	28	45.9	17	41.5
Female	33	54.1	24	58.5
Interview site				
Hospital inpatient	1	1.7	25	62.5
Outpatient	-	-	14	35.0
Home	53	89.8	1	2.5
Other	5	8.5		
Unknown	2		1	
Marital status				
Single	12	19.7	1	2.8
Married / partnership	30	49.2	26	72.2
Separated / divorced / widowed	19	31.1	9	25.0
Unknown	-	-	5	
Living situation				
Alone	5	8.2	-	-
With family / loved ones	54	88.5	23	100
Other	2	3.3	-	-
Unknown	-	-	18	
Education				
Less than primary school	15	24.6		
Primary school only	22	36.1	20	50.0
High school / vocational training	5	8.2	10	25.0
College or university	19	31.1	10	25.0
Unknown			1	
Employment status				
Working full-time	2	3.3	9	22.5
Working part-time	-	-	1	2.5
Student / in-training	-	-	-	-
Homemaker/parent/carer	1	1.6	12	30.0
Unemployed	12	19.7	-	-

	South Africa (n = 61)		DRC (n = 41)	
	Mean	Min-Max; SD	Mean	Min-Max; SD
Self-Employed	3	4.9	14	35.0
Retired	37	60.7	4	10.0
Other	6	9.8		
Unknown			1	
Cancer site				
Breast	12	19.7	10	24.4
Prostate	14	23.0	6	14.6
Colorectal	2	3.3	3	7.3
Lung	26	42.6	1	2.4
Head & Neck	2	3.3	3	7.3
Gynaecologic	5	8.2	7	17.1
Brain	-	-	2	4.9
Other	-	-	9	22.0
Cancer stage¹				
UICC stage I	-	-	-	-
UICC stage II	3	6.1	7	58.3
UICC stage III	7	14.3	5	41.7
UICC stage IV	39	79.6		
Unknown	12		29	
Comorbidity				
None	22	36.7	5	15.6
One-or-more	38	63.3	27	84.4
Unknown	1		9	
ECOG Status²				
0 – Asymptomatic	7	11.6	1	2.4
1 – Symptomatic but completely ambulatory	21	35.0	7	17.1
2 – Symptomatic, < 50% in bed during the day	12	20.0	11	26.8
3 – Symptomatic, > 50% in bed, but not bedbound	11	18.3	16	39.0
4 – Bedbound	9	15.0	6	14.6
Unknown	1		-	
¹ UICC = Union for International Cancer Control				
² ECOG = Eastern Cooperative Oncology Group Performance Status				

Table 1

Overall, SA patients with cancer under palliative care appear to report higher levels of functioning health and lower symptom levels compared to Congolese PC patients with cancer. Merely for the symptom domain "Constipation" Congolese patients reported a lower mean score compared to SA patients. For SA patients the prevalence of clinically important problems was highest for Physical Function (68.9%), closely followed by Dyspnoea (67.2%) and Pain (65.6%). For the Congolese palliative cancer population, the prevalence of clinically important symptoms / health limitations appears generally higher with 95.0% of patients reporting a clinically important level of pain, 92.7% reporting a clinically important level of dyspnoea. Further, 87.8% reported clinically important levels of Fatigue, limitations in Emotional Functioning, and limitations in Physical Functioning respectively. When pooling SA and DRC patients and comparing SSA to matched European patients, the odds of presenting clinically important problems were statistically significant higher for SSA patients on the domains Physical Function (OR 3.4; 95% CI 1.4–8.2) and Constipation (OR 7.8; 95% CI 2.6–23.5). Details are presented in Table 2.

Table 2
HRQoL of South African (n = 61) and Congolese (n = 41) palliative cancer patients

						Case-control matched European controls (n = 44)	Odds Ratios* for presenting clinically important problems
South Africa		DRC		Austria and Spain		SSA vs. matched European (n = 88)	
	Mean (SD)	Prevalence of clinically important problems (%) ^a	Mean (SD)	Prevalence of clinically important problems (%) ^a	Mean (SD)	Prevalence of clinically important problems (%) ^a	Odds Ratios (95% CI)
Global quality of life ^b	64.5 (27.0)		51.2 (21.2)		54.9 (21.1)		
Physical Function ^b	56.5 (35.8)	68.9%	45.5 (30.4)	87.8%	83.8 (18.5)	38.6%	3.4 (1.4–8.2)
Emotional Function ^b	69.2 (30.6)	49.2%	45.5 (27.1)	87.8%	72.3 (28.0)	40.9%	1.2 (0.5–2.8)
Fatigue ^c	48.6 (34.2)	55.0%	72.0 (25.9)	87.8%	45.5 (30.2)	43.2%	1.5 (0.7–1.7)
Nausea ^c	21.9 (28.5)	44.3%	42.5 (35.4)	72.5%	15.2 (29.2)	27.3%	2.2 (0.9–5.4)
Pain ^c	42.6 (30.2)	65.6%	79.2 (25.0)	95.0%	23.5 (23.1)	47.7%	1.9 (0.8–4.5)
Dyspnoea ^c	39.3 (36.3)	67.2%	60.2 (30.0)	92.7%	22.7 (28.6)	47.7%	2.1 (0.9–5.0)
Insomnia ^c	35.6 (36.2)	35.0%	63.4 (27.7)	80.5%	37.9 (34.9)	38.6%	0.7 (0.3–1.7)
Appetite loss ^c	39.3 (39.2)	39.3%	63.4 (34.0)	77.5%	31.1 (34.8)	31.8%	1.5 (0.6–3.6)
Constipation ^c	56.8 (39.6)	57.4%	41.5 (36.3)	34.1%	11.4 (22.7)	11.4%	7.8 (2.6–23.5)
^a According to thresholds for clinical importance for the EORTC QLQ-C15-PAL (31).							
^b High scores on the Global Health status / QOL and functional health scales indicate a high level of functioning / QOL.							
^c High scores on the symptom scales indicate a high level of symptoms.							
*Odds Ratios display the relative chance of presenting a clinically important problem of case-control matched patients from SSA (pooled) vs. Europe according to the thresholds for clinical importance. Statistically significant OR (< 0.05) highlighted bold .							

Table 2

The unadjusted results (ANOVA), in investigating HRQoL differences between countries, indicate that statistically significant differences may exist for nine HRQoL domains, all except the domain Global QoL. The highest effect size was found for the domain Pain (Cohens' F = 0.785), whereby the domains Physical Function, Dyspnoea, and Constipation showed a large effect (Cohens' F > 0.4) for between country differences (Table 3).

Table 3

ANOVA results of HRQoL of South African (n = 61) and Congolese (n = 41) palliative cancer patients in comparison to Austrian and Spanish controls

	South Africa		DRC		Austria		Spain		p-value*	Cohen's F
	Marg. Mean	95% CI	Marg. Mean	95% CI	Marg. Mean	95% CI	Marg. Mean	95% CI		
Global quality of life ^a	64.5	58.4–70.6	51.2	43.7–58.7	57.6	47.9–67.4	60.0	54.6–65.5	0.061	0.193
Physical Function ^a	56.5	49.6–63.3	45.5	37.2–53.9	83.8	72.8–94.7	82.9	76.8–89.0	< 0.001	0.594
Emotional Function ^a	69.1	61.9–76.3	45.5	36.8–54.3	77.1	65.6–88.5	65.6	59.3–71.9	< 0.001	0.353
Fatigue ^b	48.6	40.7–56.5	72.0	62.4–81.5	43.8	31.3–56.2	48.9	42.0–55.8	< 0.001	0.318
Nausea ^b	21.9	14.6–29.2	42.5	33.5–51.5	15.3	3.6–26.9	12.4	5.9–18.9	< 0.001	0.388
Pain ^b	42.6	35.7–49.5	79.2	70.7–87.6	26.4	15.4–37.4	22.2	16.1–38.3	< 0.001	0.785
Dyspnoea ^b	39.3	32.0–46.7	60.2	51.2–69.1	29.2	17.4–40.9	13.7	7.2–20.2	< 0.001	0.605
Insomnia ^b	35.6	27.4–43.7	63.4	53.5–73.3	34.7	21.8–47.6	36.3	29.2–43.5	< 0.001	0.350
Appetite loss ^b	39.3	30.5–48.2	63.4	52.7–74.2	25.0	11.0–39.0	34.2	26.4–42.0	< 0.001	0.353
Constipation ^b	56.8	48.5–65.2	41.5	31.3–51.7	11.1	-2.2–24.4	16.2	8.9–23.6	< 0.001	0.570
* Univariate test for the variable “country”; significant domains (p < 0.05) highlighted bold										
^a High scores on the Global QoL and functional health scales indicate a high level of functioning / QOL.										
^b High scores on the symptom scales indicate a high level of symptoms.										
Abbreviations: Marg. Mean = Marginal Mean; SE = Standard Error, 95% CI = 95% Confidence Interval										

Table 3

Adjusting for the covariates age, sex, comorbidities, and cancer stage (ANCOVA) omits the statistically significant difference for five HRQoL domains, whereby the domains Physical Functioning (p < 0.001), Pain (p = 0.002), Dyspnoea (p = 0.004), and Constipation (p < 0.001) still exhibit statistically significant between-country differences. The effect sizes for these domain differences range from η_p^2 of 0.09 for Dyspnoea to 0.24 for Constipation, indicating a medium to large effect of “country” on the domains where statistically significant differences remained. Details in Table 4.

Table 4

ANCOVA and regression results of HRQoL of South African (n = 61) and Congolese (n = 41) palliative cancer patients in comparison to Austrian and Spanish controls adjusted for the covariates age, sex, cancer stage, comorbidity, and interaction terms.

	South Africa		DRC		Austria		Spain		p-value*	Cohen's F	R ²	β†
	Marg. Mean	95% CI	Marg. Mean	95% CI	Marg. Mean	95% CI	Marg. Mean	95% CI				
Global quality of life ^a	66.3	58.4–74.2	47.2	27.9–66.6	58.7	47.8–69.7	55.8	48.6–63.0	0.141	0.201	0.067	1.6
Physical Function ^a	60.6	52.8–68.3	65.1	46.2–84.1	85.0	74.3–95.8	79.8	72.8–86.9	< 0.001	0.387	0.310	-10.9
Emotional Function ^a	68.6	60.0–77.4	51.3	30.0–72.6	74.9	62.8–87.1	65.6	57.6–73.5	0.256	0.173	0.170	-4.2
Fatigue ^b	46.0	36.1–56.0	51.0	27.1–74.9	43.6	30.0–57.2	47.8	38.9–56.7	0.939	0.055	0.073	1.4
Nausea ^b	20.3	11.8–28.9	36.6	15.6–57.5	14.6	2.6–26.5	18.4	10.6–26.2	0.342	0.157	0.155	4.6
Pain ^b	42.5	34.2–50.7	57.6	37.5–77.8	28.5	17.1–40.0	23.8	16.4–31.3	0.002	0.342	0.265	9.7
Dyspnoea ^b	36.2	27.1–45.4	51.3	28.8–73.7	29.2	16.4–42.0	15.2	6.9–23.5	0.004	0.322	0.200	7.5
Insomnia ^b	33.7	23.6–43.9	43.4	18.7–68.2	38.1	24.0–52.1	39.9	30.7–49.1	0.797	0.090	0.126	-1.1
Appetite loss ^b	38.0	26.9–49.1	50.9	23.8–78.0	25.2	9.8–40.6	34.7	24.7–44.8	0.349	0.157	0.104	6.8
Constipation ^b	56.5	46.4–66.6	26.5	1.8–51.2	11.0	-3.0–25.0)	17.5	8.3–26.7	< 0.001	0.556	0.296	17.7
* Multivariate test for the variable “country”; significant domains (p < 0.05) highlighted bold												
† Regression coefficient for the categorical variable “department” ranked in accordance with their level of palliative care systems												
^a High scores on the Global QoL and functional health scales indicate a high level of functioning / QOL.												
^b High scores on the symptom scales indicate a high level of symptoms.												
Abbreviations: Marg. Mean = Marginal Mean; SE = Standard Error, 95% CI = 95% Confidence Interval												

Table 4

The results of the GLM indicate that the presence of comorbidities exhibits country-specific associations with Emotional Functioning (p = 0.012; up to -24.4 points (95% CI -49.8–0.9) for Spain to +20.9 points (95% CI 6.6–35.2) for SA), and Global QoL (p = 0.007; up to -19.6 points (95% CI -44.2–4.9) for DRC to +24.3 points (95% CI 11.8–36.8) for SA). Age exhibited a country-specific association with four domains. These were Fatigue (p = 0.049; up to -0.4 points/year (95% CI -1.7–0.8) for Spain to +0.9 points/year (95% CI 0.2–1.7) for DRC), Pain (p < 0.001; up to -1.0 points/year (95% CI -2.1–0.0) for SA to +0.7 points/year (95% CI 0.0–1.3) for DRC), Sleep Disturbance (p = 0.018; up to -1.9 points/year (95% CI -3.7 – -0.2) for Austria to +0.4 points/year (95% CI -0.4–1.2) for DRC), and Appetite Loss (p = 0.005; up to -0.6 points/year (95% CI -2.0–0.8) for Spain to +1.2 points/year (95% CI 0.4–2.1) for DRC). Country specific associations were further found for Appetite Loss and sex (p = 0.020), whereby the extremes were found for DRC (females - 38.7 points; 95% CI = -64.3 - -13.1) and Austria (females + 8.9 points; 95% CI = -37.3–19.6). Detailed results are reported in Appendix 1.

Discussion

In this descriptive and exploratory study, we assessed HRQoL – functional health states and symptoms – of patients with cancer under palliative care in the two countries of South Africa and the Democratic Republic of the Congo. First, the relatively high symptom burden on specific health domains appears noteworthy. Close to 90% of Congolese PC patients reported clinically important health problems on five of the ten health domains assessed by the EORTC QLQ-C15-PAL. For SA PC patients, the prevalence of clinically important health problems appears lower, still on five health domains more than 50% of SA patients reported clinically important impairments. Despite the relatively high states of symptom burden and functional health limitations, the patients from SSA reported better levels of Global QoL in comparison to European patients with cancer under palliative care. The Global QoL domain was the only health domain, where SSA patients systematically reported higher levels of health in comparison to matched European controls. While a similar observation was previously made for patients with cancer from the DRC (REF in press), the authors hypothesized that this occurrence may represent a difference in the type of “internal reference” on what is considered a “normal” quality of life. This may be conceptually similar to concepts like “response shifts” (35), or the “reference point” in the prospect theory (36), whereby the Global QoL item may be linked to the “internal reference point”. Further the domain Global QoL may conceptually encompass aspects of life which go beyond health. A similar finding was reported previously for palliative care patients from different centres in SSA, whereby the Global QoL was weakly correlated with a composite score of other HRQoL domains (37). The differences in significance levels between the ANOVA and ANCOVA suggest, that confounding effects are introduced by the sample composition – particularly in respect to age, sex, comorbidity, and cancer stage. While previous country-level analyses in Austria and Spain reported varying associations for age and sex (33, 34), no such literature is currently available for South Africa or the DRC. Further, the results of the GLM indicate that the association of covariates and certain HRQoL scores may differ across countries. This insight in particular warrants further attention, as it highlights a potential difference of moderating effect of covariates on HRQoL across countries.

The HRQoL results of this study somewhat reflect recent evidence on the level of PC systems globally. Here, PC systems globally were rated according to six criteria: service delivery, essential medicines, education, community empowerment, research, and policy. While the PC system in the DRC was classified as “progressing”, the SA, as well as the Spanish, were classified as “established” PC system. Only the Austrian system met the criteria to be classified as “advanced” PC system (2). In accordance with this classification, we observed confounder adjusted country level differences of HRQoL scores, which often exceed thresholds of between group differences representing medium or large effects (38). Particularly the elevated symptom levels for SSA patients (i.e. pain or constipation) may reflect a gap of PC service delivery, as these are typically considered well-manageable symptoms (39).

The global disparities in the provision of palliative care (2), and specifically oncologic care have long been documented (40). Specifically in oncology, disparities may be accentuated due to the complex nature and multidisciplinary patient management throughout diagnosis, treatment and PC delivery (41). Factors such as socioeconomic status, underrepresentation in clinical trials, or rural habitats further drive disparities in the access to anti-cancer therapies (42, 43). Hence, various global health organizations and researchers issued calls and pledges to combat disparities in (40, 44), and enhance diversity global cancer research(45) and cancer clinical trials (46, 47). The authors of this manuscript wish to support these initiatives and believe that the results of this research may contribute to these efforts in terms of advocacy and research.

With regard to trial designs, our findings may also provide some valuable insights. Provided the globalisation of cancer clinical trials, with international multicentric studies, and HRQoL data being an increasingly important outcome in cancer clinical trials and market authorisation decisions (48), the systematic differences of HRQoL reports appears to have potential implications for trial designs. This may particularly apply to decisions related to randomisation and the stratification for geographic locations (49).

Strengths and Limitations

Our study is not without limitations. Firstly, the cross-sectional study merely allows to estimate associations and not causalities of country level specifics and HRQoL data. While controlling for various variables (age, sex, comorbidities, cancer stage) the sample size of recruited patients did not allow us to control for variables such as the type of cancer. Additionally, the diverging sampling strategies i.e. home-based vs. hospital/clinic setting in SA and the DRC may impact the results. Thus, confounding factors, such

as socioeconomic characteristics impacting the access to hospital-based care, remain in the interpretation of the results, which the reader of this manuscript should be aware of. In accordance, a further limitation is that we did not assess the specific socioeconomic factors, such as disposable income. This leads us to draw comparisons based on country-meta data of PC systems but limits us to compare socioeconomically similar patients (e.g. purchasing-power-parity) across the countries. The authors' impression is that certain patients from SA were socio-economically disadvantaged and therefore relied on the free PC services provided by the community hospices (as non-profit organisations), while patients in the DRC required a certain socio-economic status to access treatment and PC options. Thus, comparing the patients, without further adjustment for socioeconomic variables, may introduce a bias in the county-level comparison. Therefore, the country-level comparison should be viewed as purely explorative. Lastly, we would like to mention that EORTC QLQ-C15-PAL does not assess spiritual well-being. Still, this domain is deemed an important HRQoL aspect for patients with cancer with advanced diseases (50) particularly for patients in SSA (51). Therefore, it is a limitation that we cannot provide HRQoL reports for this potentially important health domain.

Conclusion

To the best of our knowledge, this is the first empirical study which particularly describes HRQoL for patients with cancer receiving PC from SA and the DRC. The HRQoL reports provide a first understanding of health impairments and symptoms in this patient population. County-level comparisons hint on aspects of PC care delivery / symptom management which ought to be improved.

Declarations

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Conflict of Interest:

The authors have no conflict of interest to declare.

Authors Contribution Statement:

Concept and design: MJP, JMG,

Acquisition of data: MJP, AMT, RM, JIA

Analysis and interpretation of data: MJP, JMG, LRH,

Drafting of the manuscript: MJP, JMG

Critical revision of the paper for important intellectual content: LRH, AMT, JIA, RM,

Statistical analysis: MJP, JMG, LRH

Provision of study materials or patients: JIA, RM, AMT

Obtaining funding: MJP, JMG

Administrative, technical, or logistic support: LRH, AMT, JIA

Supervision: JMG, RM,

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Data availability:

Data may be made available upon reasonable request.

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- [AppendixSociodemographicandClinicalVariablesControls.docx](#)