

Healthcare provider perspectives on integrating HIV care into cancer centers in Malawi, South Africa, Uganda, and Zimbabwe[☆]

Michalina A Montaño^{a,b,c,*}, Alfred Jatho^d, Cecilia Nassolo^d, Noleb Mugisha^d, Agatha Bula^e, Maganizo B Chagomerana^{e,f}, Margaret Borok^g, Takudzwa J Mtisi^g, Maureen Joffe^h, Rachel A. Bender Ignacio^{b,c}, Ntokozi Ndlovu^g

^a Department of Global Health, University of Washington, Seattle, USA

^b Department of Medicine, Division of Allergy and Infectious Diseases, University of Washington, Seattle, USA

^c Vaccine and Infectious Diseases Division, Fred Hutchinson Cancer Center, Seattle, USA

^d Uganda Cancer Institute, Kampala, Uganda

^e UNC Project Malawi, Lilongwe, Malawi

^f Department of Medicine, University of North Carolina at Chapel Hill, Chapel Hill, USA

^g Faculty of Medicine and Health Sciences, University of Zimbabwe, Harare, Zimbabwe

^h Faculty of Health Sciences, Strengthening Oncology Services Research Unit, University of Witwatersrand, Johannesburg, South Africa

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ABSTRACT

Background: In East and Southern Africa, treatment of people with concomitant cancer and HIV is complicated by siloed service delivery pathways, which exacerbate barriers to care and impact clinical decision-making. Integrating HIV care into cancer treatment centers may improve service delivery and overall patient outcomes.

Methods: We administered a questionnaire to clinicians and support staff at tertiary cancer referral centers in Malawi, Zimbabwe, Uganda, and South Africa to assess level of concern about clinical management of people with HIV (PWH) and cancer, barriers to integrating HIV service delivery into cancer treatment delivery, and beliefs related to HIV, antiretroviral therapy (ART), and integrated care.

Results: Of 195 clinician and support staff participants, 165 (85 %) were direct providers of cancer-associated care. Over 50 % indicated that they held concerns about survival, treatment complications, co-morbidities, and drug-drug interactions in PWH compared to patients without HIV. Over 80 % agreed that knowing cancer patients' HIV status, ART status, and ART regimen would facilitate better care and should be considered in cancer care decision-making. Overall, respondents were optimistic that HIV-related care could be easily integrated into cancer care provision. The most-frequently endorsed barriers to integrated care were workspace limitations, disruptions to workflow, availability of staff, and cost to the hospital and to patients.

Conclusions: Cancer clinicians and support staff report overall positive attitudes toward integrating HIV and cancer service delivery. Research to elucidate service delivery pathways and contextualize system-based barriers to integrating care are critical next steps to optimize linked HIV and cancer care delivery.

Introduction

Cancer poses a major challenge to health systems in sub-Saharan Africa, with both cancer incidence and mortality expected to double between 2020 and 2040 [1]. In this region, people with HIV (PWH) are at higher risk both of developing certain cancers and experiencing poorer cancer-related outcomes such as rapid progression and treatment complications [2–9]. While countries in this region have continued to

make progress toward universal ART coverage, people with HIV are living longer, and the epidemiology of concomitant diseases in this population has shifted [3,10–12]. Non-communicable diseases (NCDs), including many cancers, now make up a large proportion of disease burden among PWH [1,3,9,10,13]. Consequently, PWH comprise a substantial proportion of cancer patients in this region, with HIV prevalence among cancer patients 2- to 4-times higher than the general population HIV prevalence [14–17].

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* Corresponding author: Michalina A Montaño, Fred Hutchinson Cancer Center, 1100 Fairview Ave. N, Seattle, WA 98109, USA.

E-mail address: mmontano@fredhutch.org (M.A. Montaño).

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Both the US National Comprehensive Cancer Network (NCCN) and the harmonized guidelines for Sub-Saharan Africa developed by the African Cancer Coalition in collaboration with the NCCN recommend co-management of HIV and cancer care for PWH, including uninterrupted antiretroviral therapy (ART) during cancer treatment, and the involvement of HIV specialists in co-management of clinical care [18,19]. Additionally, the NCCN recently developed resource-stratified guidelines to provide recommendations for cancer care in resource-constrained settings [20]. However, in East and Southern Africa, where HIV and cancer care delivery are siloed, cancer-related medical records often do not contain HIV-related health information, such as HIV and ART status, ART regimen and duration, CD4 count, and viral load [17]. There is no formal guidance regarding strategies for co-management of cancer and HIV care across siloed institutions. Cancer care providers in the region contend with a shortage of evidence-based guidance as well as limited HIV-related information about their patients to incorporate into their practice, particularly with respect to cancer care decision-making.

Due in part to the increasing NCD burden among PWH, the World Health Organization (WHO) and Joint United Nations Programme on HIV/AIDS (UNAIDS) have called for integration of NCD screening and management within existing HIV care platforms [21,22]. This promising solution to the emerging crisis of NCD care delivery leverages existing infrastructure and regular health system engagement in order to conduct NCD screening and care for PWH [23]. For cancer, the integration has been limited to cancer prevention and screening with little guidance on appropriate management of patients who require cancer therapy because most current programs to integrate NCD care are implemented in HIV primary care settings [22,24]. Completely integrating cancer care delivery into local primary care settings to enable co-management of HIV and cancer care is not feasible because cancer treatment is largely limited to tertiary or quaternary care settings, often exclusively located in national or regional capitals.

Incorporating HIV-related information into cancer clinical records and integrating some components of HIV care delivery into tertiary cancer treatment settings may be required for effective co-management of HIV and cancer clinical care. These strategies may simplify patient access to HIV care during cancer treatment, in addition to enabling providers to make cancer treatment and care decisions based on more complete HIV-related information. Understanding the perspectives of cancer care providers on care of cancer patients with HIV, and their beliefs about integrating these care pathways, will be crucial to developing strategies to improve care delivery. We formed a new consortium of cancer and HIV clinicians and researchers from cancer treatment institutions in Malawi, South Africa, Uganda, and Zimbabwe to develop evidence-based strategies and guidelines for co-management of HIV and cancer care. To better understand provider perspectives on co-management of HIV and cancer care, we conducted a mixed-methods study at participating cancer centers.

Methods

Study design, setting, population, and recruitment

We developed a structured questionnaire to interrogate perspectives on the care of cancer patients with HIV and integration of HIV and cancer care delivery in cancer treatment settings as part of the mixed-methods study. The questionnaire was administered at four cancer referral sites: Kamuzu Central Hospital (KCH) in Malawi, Charlotte Maxeke Johannesburg Academic Hospital (CMJAH) and the Soweto Comprehensive Cancer Centre in South Africa (sister academic Medical Oncology treatment centers combined as one site), the Uganda Cancer Institute (UCI) in Uganda, and Parirenyatwa Group of Hospitals (PGH) in Zimbabwe. Clinical, administrative, research, and laboratory staff involved in oncology service provision at each center were eligible to participate. Study coordinators at each site obtained staff lists of all

current radiotherapy and oncology department employees. Surgeons and surgical staff were excluded due to the infrequent nature of their contact with patients to prioritize the experiences of staff with regular, recurring interaction with patients. Staff were recruited directly by study coordinators using a total population sampling approach where all oncology staff at each institution were invited to participate. The study participants self-administered the questionnaire either directly on the REDCap App or on paper with subsequent REDCap data entry by study staff. All study participants gave written informed consent prior to participating. This work was approved by the institutional review board and/or national ethics review at each site, as well as the institutional review board at the University of Washington.

Questionnaire content

The questionnaire was developed by the study team, with oncology care providers and researchers at each study site solicited for feedback on questions and response options during questionnaire development to ensure they were comprehensive and contextually appropriate. We collected information on respondents' role within the cancer centers, concerns specific to treating cancer in PWH, beliefs about HIV, ART, and integrating HIV and cancer care delivery, and barriers to integrating components of HIV care within cancer care delivery. In addition, participants involved in the provision of clinical cancer care were asked about the clinical care they provided to cancer patients with HIV during the 3 months prior to questionnaire completion, how often they provided cancer care to PWH, and how often they treated cancer patients with HIV who were not on ART (daily, weekly, monthly, less than monthly, never). Participants involved in the provision of clinical cancer care were also asked to rate their level of concern regarding components of cancer care for PWH compared to patients without HIV (more, less, or the same level of concern).

Beliefs about HIV, ART, and integrating HIV and cancer care were assessed using 5-point Likert scales (strongly agree to strongly disagree), with participants asked to rate their level of agreement with a series of statements related to each topic. Barriers to integrated care were assessed in two ways. First, participants were presented with a list of HIV care delivery activities and were asked to rate how easy or difficult each activity would be to integrate into cancer care delivery on a five-point Likert scale (very easy to very difficult). Second, participants were presented with a list of potential barriers to each of three HIV care activities: HIV testing for patients with unknown HIV status, ART initiation for patients newly diagnosed with HIV or not currently on ART, and providing ART prescription refills for PWH already taking ART. Participants were asked to rate on a five-point Likert scale how difficult each potential barrier would make implementing the HIV care activity within their institution.

Statistical analysis

We used descriptive statistics to summarize questionnaire responses for all participants from all four sites. We compared questionnaire responses across study sites using Pearson's chi-squared test. For five-point Likert scales measuring difficulty (very easy to very difficult) we present the proportion of participants who rated each activity or aspect of care delivery to be somewhat or very difficult.

Results

A total of 195 respondents completed the questionnaire, of whom 189 (97 %) had direct contact with patients in their role, and 165 (85 %) provided cancer treatment or other clinical care through their role at the cancer center (Table 1). The response rate at each site was >90 % within eligible job titles. Nurses made up the largest proportion of respondents ($n = 96$, 49 %). Of the 165 respondents involved in clinical care, 143 (87 %) reported providing cancer care to patients with HIV (PWH) daily or

Table 1

Characteristics of respondents to provider questionnaire, N = 195.

Characteristic	n	%
Site		
Malawi	57	29.2
South Africa	42	21.5
Uganda	39	20.0
Zimbabwe	57	29.2
Role at cancer center		
Counsellor	8	4.1
Data Clerk	6	3.1
Medical Officer	27	13.8
Nurse	96	49.2
Pharmacist	10	5.1
Physician	20	10.3
Research Staff	8	4.1
Other ^a	20	10.3
Direct contact with patients	189	96.9
Provide cancer treatment or related clinical care	165	84.6
Provide cancer care to patients with HIV daily or weekly ^b	143	86.7
Provide cancer care to HIV+ cancer patients not on ART daily or weekly ^b	47	28.5

^a Includes administrators, laboratory personnel, medical records officers, patient navigators, radiographers.

^b Denominator for frequency providing care to patients with HIV is 165 respondents who provide cancer care.

weekly and 47 (29 %) reported providing cancer care to PWH who were not taking ART weekly or more often.

When queried about their level of concern regarding clinical management of PWH compared to patients without HIV, most respondents (>90 %) indicated similar or higher levels of concern on all topics (Fig. 1). Drug-drug interactions, co-morbidities, treatment complications, survival, and medication adherence were of highest concern, with over 50 % of respondents indicating that they were more concerned about these themes for patients with HIV than for HIV-negative patients. Reported levels of provider concern were similar across the four sites (Supplementary Table 2).

When asked about HIV in the context of cancer care, most

respondents (>80 % across sites) strongly agreed that HIV status should be considered in cancer care decision making, and that knowing patients' HIV status would enable them to provide better care and make better treatment decisions (Fig. 2). Respondents felt similarly about ART in the context of providing cancer care, with the majority strongly agreeing that ART status should be considered in cancer care decision making, and that knowing patients' ART status and regimen would facilitate better care, including better treatment decisions. Most respondents (>70 % across sites) somewhat or strongly agreed that HIV increases the risk of complications from cancer treatment. However, there were mixed responses regarding whether ART increases the risk of complications. Respondents had generally positive attitudes toward integrating HIV and cancer care delivery, with over 90 % agreeing that coordinating HIV and cancer care is important and would improve treatment outcomes for those with both conditions. Over 85 % of respondents agreed that HIV-related care could easily be integrated into the flow of cancer care. HIV- and ART-related beliefs were similar at all four sites (Supplementary Table 3). There were slight differences in beliefs related to difficulty of integrating HIV care across the four sites, with respondents from South Africa less likely to strongly agree that HIV care integration would be easy to accomplish than respondents from other sites.

The proportion of respondents who perceived providing HIV-care activities at their cancer center to be somewhat or very difficult ranged from 9.7 to 22.6 % (Table 2). Obtaining prior HIV-related health records and switching patients' ART regimens at the cancer center were perceived to be most difficult, while determining current ART status and regimen and offering or referring patients for HIV testing were perceived to be easiest activities. There were differences in perceptions of difficulty for most activities across sites, although the proportion of respondents who perceived offering or referring patients for HIV testing to be difficult was uniformly low across sites (Supplementary Table 4). The largest reported barriers to integrating routine HIV testing, ART initiation, and provision of ART refills into cancer service delivery were related to resource constraints (Table 3). Respondents judged workspace and staff availability, workflow disruptions, and lack of resources for patients to be among the barriers that could most impede implementation of these activities. There were differences in which barriers were

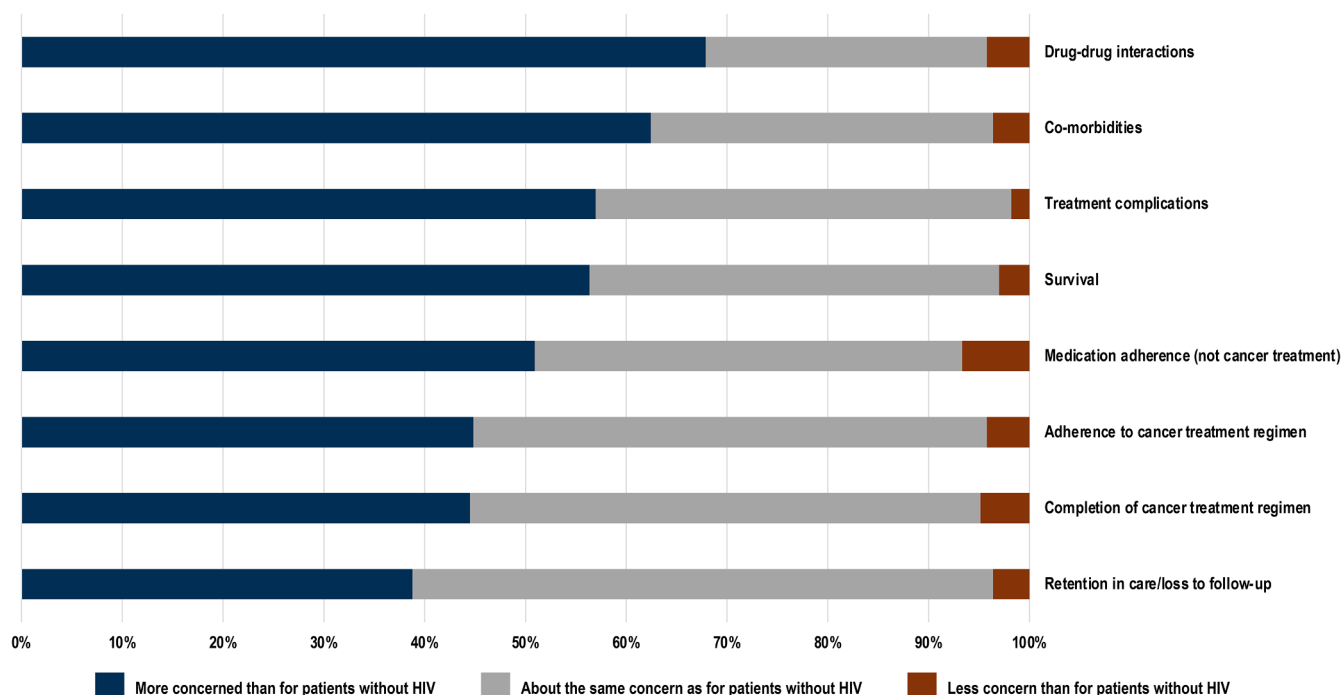


Fig. 1. Cancer care provider level of concern regarding components of cancer-related care for patients with HIV compared to patients without HIV (n = 165).

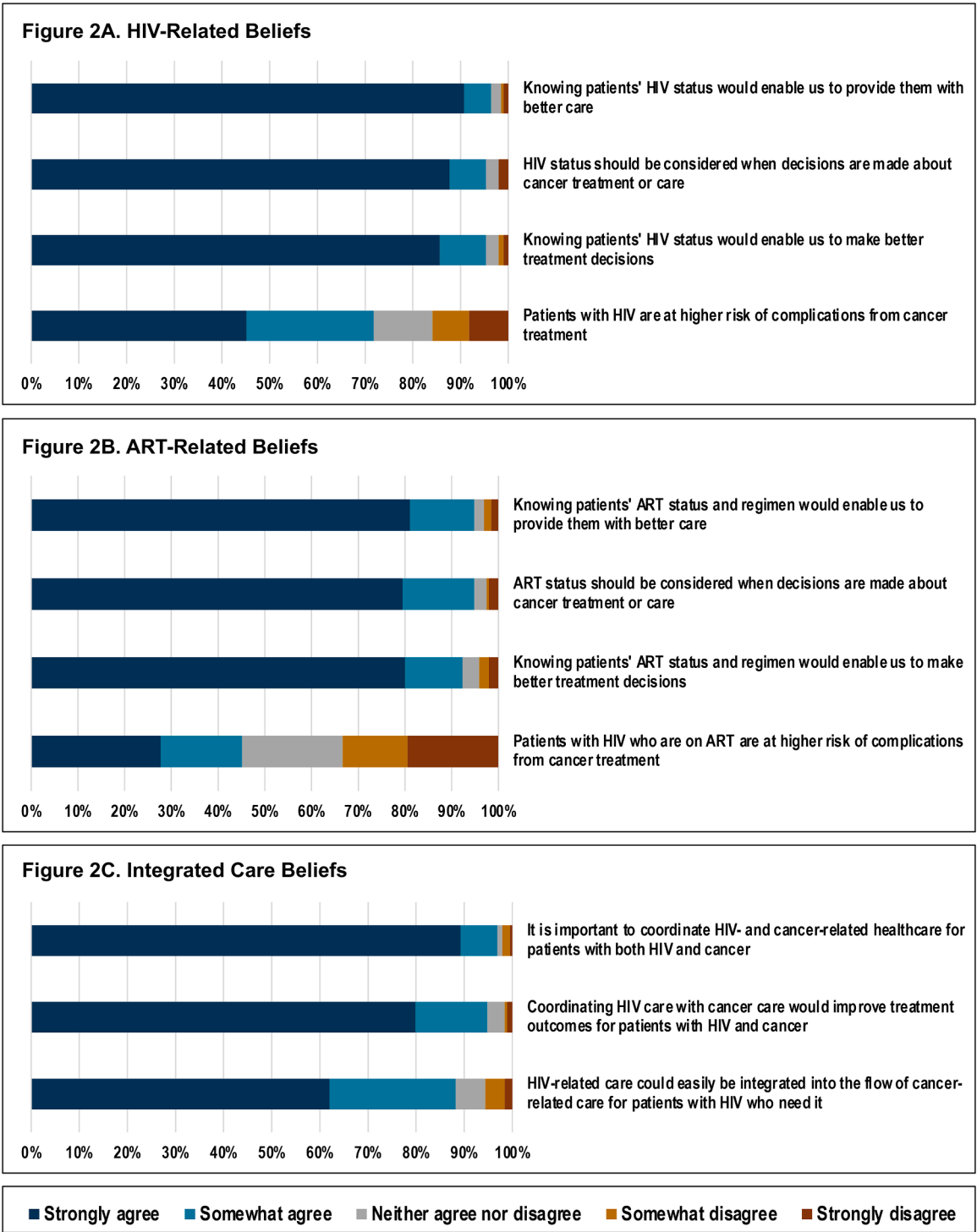


Fig. 2. Cancer care provider beliefs about HIV, ART, and integrated care.

reported to be most the difficult to address across the four sites (Supplementary Table 5).

Discussion

The findings we report above are from one of the first studies to assess cancer clinician and multidisciplinary staff perspectives on the integration of HIV and cancer care delivery in East and Southern African cancer referral centers. Most respondents to our questionnaire were directly involved in clinical care provision for patients with cancer;

many reported concerns about survival, treatment complications, and comorbidities among their patients with HIV. Most respondents agreed that information about cancer patients' HIV and ART status needed to be available for cancer care decision-making, and that coordinating HIV and cancer care would improve patient outcomes. Encouragingly, respondents were supportive of care integration, and optimistic that HIV care could be easily integrated into cancer care centers. However, oncology care providers reported several system-related barriers which should be addressed for strategies to integrate HIV and cancer care to succeed in these health systems.

Table 2
Proportion of questionnaire respondents who consider incorporating each HIV care delivery activity into cancer care delivery to be somewhat or very difficult, N = 195.

Activity	n	%
Obtaining health records related to HIV for patients with HIV	44	22.6
Switching ART regimens	42	21.5
Offering refills of ARVs for patients with HIV	35	17.9
Monitoring HIV response to treatment	29	14.9
Obtaining periodic CD4 counts for patients with HIV	29	14.9
Obtaining periodic viral load for patients with HIV	28	14.4
Determining ART regimen for patients with HIV	27	13.8
Referring patients with unknown HIV status for HIV testing	21	10.8
Offering HIV testing to patients with unknown HIV status	19	9.7
Determining ART status for patients with HIV	19	9.7

Table 3
Proportion of questionnaire respondents who consider each aspect of HIV care delivery activity implementation to be somewhat or very difficult, N = 195.

	n	%
Routine HIV testing for patients with unknown HIV status		
Workspace limitations	110	56.4
Lack of resources for patients who test positive	82	42.1
Disruptions to existing workflow	79	40.5
Cost to cancer centre	75	38.5
Implementing separate standard guidelines for both HIV testing and cancer care	69	35.4
Cost to patients	61	31.3
Availability of staff to conduct HIV testing	59	30.3
Supervision of HIV care	58	29.7
HIV-related stigma	56	28.7
Access to HIV test kits	43	22.1
Education/training staff	22	11.3
ART Initiation for patients newly diagnosed with HIV or who are not on ART		
Inadequate number of health workers/other staff	131	67.2
Workspace limitations	109	55.9
Lack of resources for patients	96	49.2
Disruptions to existing workflow	94	48.2
Cost to cancer centre	82	42.1
Availability of staff to provide this service	79	40.5
Cost to patients	77	39.5
HIV-related stigma	66	33.8
Implementing separate standard guidelines for both HIV and cancer care	61	31.3
Monitoring ART response and side effects	58	29.7
Availability of ART	47	24.1
Performing or obtaining viral load and CD4 count	43	22.1
Education/training staff	39	20.0
Referring patients to long-term HIV care	37	19.0
Providing ART prescription refills for patients with HIV who are already on ART		
Workspace limitations	112	57.4
Disruptions to existing workflow	92	47.2
Availability of staff to provide this service	83	42.6
Cost to cancer centre	80	41.0
Cost to patients	65	33.3
Separate guidelines for HIV and cancer care	57	29.2
HIV-related stigma	52	26.7
Monitoring ART response and side effects	45	23.1
Access to ARVs	44	22.6
Availability of friends or family members to collect refills	42	21.5
National Health Ministry policy change allowing integration of cancer and HIV care management	41	21.0
Proximity of cancer centre to HIV care clinic	35	17.9
Education/training staff	34	17.4

Oncology care providers who responded to our questionnaire demonstrated a comprehensive and evidence-based understanding of the clinical risks to their patients with HIV. They reported several topics for which their level of concern was higher for cancer patients with HIV: drug-drug interactions (DDIs), treatment complications, co-morbidities, survival, and medication adherence. There is strong scientific evidence that these topics disproportionately impact cancer patients with HIV compared to those without. For example, there is substantial evidence

that PWH may have worse cancer treatment outcomes than the general population, including higher mortality and higher risk of treatment-related complications [5,25–31]. Higher morbidity and mortality during cancer treatment may in part be related to impaired immune function, including immune exhaustion despite viral suppression during cancer treatment [32,33]. Initiation of cytotoxic chemotherapy with low CD4 count is associated with worse clinical outcomes, and ART is associated with improved clinical outcomes from cancer treatment [5, 34]. This highlights a need for monitoring HIV-related care metrics in addition to cancer care metrics for patients with co-occurring HIV and cancer.

A high proportion of anticancer drugs available in Africa have historically had DDIs with first-line ART regimens [35]. This has improved recently with the recommendation of dolutegravir-based regimens as first-line ART, since dolutegravir has fewer interactions with most anticancer drugs. However, the siloed nature of cancer and HIV care delivery may leave oncologists without complete ART information on which to base cancer treatment decisions. Finally, provider concerns about medication adherence are also substantiated by evidence related to HIV care engagement. Structural barriers, including travel, clinic distance and schedule, and wait times, are associated with decreased engagement in HIV care, reduced ART adherence, and premature discontinuation of cancer treatment [36–40]. Siloed HIV and cancer care delivery may increase the likelihood of encountering structural barriers for patients attempting simultaneous access to both care delivery systems.

Cancer care providers who participated in this study largely had positive attitudes toward integrating care delivery, with few differences across study sites. Given the lack of evidence regarding cancer provider beliefs related to HIV, it is difficult to determine whether the beliefs of our respondents are likely to be reflective of provider beliefs elsewhere in the region. However, in a recent qualitative study from the United States exploring oncology provider attitudes and practices toward patients with comorbid HIV and cancer, oncologists believed that a multidisciplinary approach with communication of HIV and cancer-related information between oncology and HIV care providers facilitates better cancer care [41]. Similarly, most of our study participants agreed that knowledge of HIV and ART status would improve clinical care, should be considered in treatment decision-making, and would enable them to make better treatment decisions. These beliefs are aligned with current NCCN guidelines for cancer treatment of PWH in the US, which recommend co-management of cancer and HIV due to the importance of ART continuation, consideration of DDIs, and HIV-related immune function during cancer treatment [18]. While the currently siloed nature of care delivery worldwide poses structural barriers to integrating care, the positive responses by cancer care providers suggest that implementation of strategies to integrate HIV and cancer care delivery will be well received by oncology teams. Indeed, there was strong agreement with statements related to the importance of coordinating HIV- and cancer care, and respondents were generally optimistic that HIV-related care could easily be integrated into cancer care delivery. There were small differences between responses from each regional center with respect to importance of integrating HIV care, which may reflect differences between sites, including the fact that some sites already had functional processes between HIV and cancer clinics that could obviate the need for integration.

Despite broad support and overall optimism about integrating HIV service delivery into cancer care, respondents also reported several potential barriers to implementing care integration. Workspace and resource limitations, availability of staff to perform new tasks, disruptions to workflow, and cost in already resource-constrained settings were among the most endorsed barriers to incorporating HIV care delivery into cancer care provision. While there is limited evidence regarding barriers to integrating HIV service delivery into hospital settings in East and Southern Africa, these barriers align with commonly reported barriers to integrating NCD services into primary care settings

in the region. While many healthcare workers have positive attitudes toward integration of NCD services within HIV and other primary care settings, resource limitations, lack of trained staff, costs, and lack of infrastructure remain barriers to success [42–45]. When asked about the level of difficulty of specific HIV care activities, respondents indicated that offering ART refills, switching ART regimens, and obtaining outside HIV health records would be most difficult to achieve. These activities have a high administrative burden, requiring coordination with other healthcare systems, or are outside the clinical scope of oncology care, requiring consultation with other specialists. Differences in perceived difficulty of HIV care activities and barriers to care integration across sites are likely due to differences in health systems, cancer center structure, and policy across institutions. Our research team is exploring these contextual differences in the qualitative phase of this mixed-methods study.

Our findings should be interpreted in the context of several limitations. First, it is possible that questionnaire responses were impacted by social desirability bias. To mitigate this source of bias: each site had a local study coordinator to recruit participants and administer questionnaires; participants self-administered questionnaires; and participant names and other identifying information were only collected on consent forms and not in the questionnaire itself. However, it is unlikely we were able to eliminate this source of bias. Second, nurses make up the largest group of respondents, and we excluded surgeons and surgical staff from the study. We utilized total population sampling, and our response rate was >90 % at all sites. As a result, the proportion of respondents from each cadre of worker is reflective of the healthcare teams at our sites; nurses make up the largest cadre of the healthcare workforce at both cancer centers and primary health care facilities providing ART in East and Southern Africa. Surgeons were excluded due to employment by surgical, rather than radiotherapy or oncology departments, across all four study sites, and due to their lack of longitudinal contact with patients. However, due to these and other contextual differences between tertiary care settings, these findings may not be generalizable to cancer treatment centers in other regions, although our methods and lessons learned could prove instructive. Finally, while we are unable to explain cross-site differences based on the questionnaire data alone, we expect the planned qualitative phases of this study will provide context to questionnaire responses and will further illuminate differences in responses across study sites.

In conclusion, cancer care clinicians and staff we surveyed reported overall positive attitudes toward care integration and believed in the importance of incorporating HIV- and ART-related information into cancer clinical decision-making. These beliefs, while aligned with cancer treatment guidelines for PWH, may be difficult to put into practice in the current siloed systems of cancer and HIV care delivery in the region. As African countries move to address the increasing burden of cancer, comprehensive research agendas to improve all components of cancer care delivery from prevention and early detection through treatment and recovery will be needed. Integration of HIV and cancer service delivery will be a critical component of these research agendas, with additional research necessary to elucidate service delivery pathways, and contextualize barriers to coordinated care from both the clinician and patient perspective. Further, implementation science methods should be utilized to develop and test strategies to integrate HIV and cancer care delivery to optimize clinical care for people with comorbid HIV and cancer. It will be critical to measure both implementation and clinical outcomes to determine whether integration of service delivery can improve both access to care and cancer and HIV clinical outcomes.

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CRediT authorship contribution statement

Michalina A Montañó: Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization. **Alfred Jatho:** Writing – review & editing, Project administration, Data curation. **Cecilia Nassolo:** Writing – review & editing, Project administration, Data curation. **Naleb Mugisha:** Writing – review & editing, Methodology, Investigation, Conceptualization. **Agatha Bula:** Writing – review & editing, Methodology, Data curation, Conceptualization. **Maganizo B Chagomerana:** Writing – review & editing, Supervision, Investigation, Conceptualization. **Margaret Borok:** Writing – review & editing, Supervision, Investigation, Conceptualization. **Takudzwa J Mtisi:** Writing – review & editing, Project administration, Investigation, Data curation. **Maureen Joffe:** Writing – review & editing, Supervision, Investigation, Conceptualization. **Rachel A. Bender Ignacio:** Writing – review & editing, Supervision, Investigation, Funding acquisition, Conceptualization. **Ntokoza Ndlovu:** Writing – review & editing, Supervision, Investigation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Supplementary materials

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