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Healthcare providers perspectives on HIV-NCD integration to Meet the needs of older adults living with HIV

Jepchirchir Kiplagat^{1,2*}, Violet Naanyu^{1,3}, Jemimah Kamano^{1,4}, Rajesh Vedanthan^{1,5}, Sonak Pastakia^{1,6} and Kara Wools-Kaloustian^{1,7}

Abstract

Background Advances in antiretroviral therapy have enabled people living with HIV (PLHIV) to live longer and healthier lives. However, aging with HIV infection is accompanied by an increased risk of non-communicable diseases (NCDs), highlighting the need to integrate care services. The Academic Model Providing Access to Healthcare (AMPATH) in Eldoret, Kenya, which has been providing care for PLHIV for over 30 years, is seeing an increase in NCDs, particularly hypertension and diabetes, especially among older patients. It is unclear how healthcare providers manage the complex healthcare needs of older adults living with HIV (OALWH) and comorbid NCDs, or how they perceive the integration of hypertension and diabetes care within the HIV care platform.

Methods We conducted in-depth interviews at an AMPATH facility in Eldoret, Kenya. Ten healthcare providers (three nurses and seven clinical officers) were interviewed to explore the facilitators and barriers to integrating HIV and NCD care services for OALWH. Audio records were transcribed verbatim, content analysis was performed, and the capabilities (C), opportunities (O), and motivation (M) models for behavior change (COM-B model) were used to comprehensively map the drivers and barriers that shape healthcare providers' acceptance, adoption, and implementation of integrated HIV and NCD care services.

Results The majority of participants had worked for more than five years, offering care for people living with HIV. All participants had experience managing older adults living with HIV and expressed challenges with the lack of coordinated care delivery for HIV and NCDs. The participants highlighted the potential challenges of optimal adherence to antiretroviral therapy (ART) among OALWH in the presence of multiple chronic conditions. Based on these challenges, participants perceived the integration of hypertension and diabetes care into the HIV care platform as beneficial to clients and the overall healthcare system. Factors such as the availability of physical resources and infrastructure (C), availability of training opportunities for NCD care (O), leadership support (M), and motivation to provide person-centered care (M) were perceived as facilitators of HIV/NCD integrated care delivery. Impeding factors such as lack of guidelines for integration (O), siloed healthcare service delivery (O), inadequate resource allocation for NCDs (O), and perceived increased workload (M) were also highlighted by healthcare providers.

*Correspondence:
Jepchirchir Kiplagat
chiri2809@gmail.com; jkiplagat@ampath.or.ke

Full list of author information is available at the end of the article



Conclusion The findings of this study highlight healthcare providers' perceived facilitators and barriers to the integration of NCD care into HIV care platforms. The insights gained from this study hold the potential to inform tailored interventions, policy decisions, and capacity-building initiatives aimed at fostering successful integration and improving overall health care delivery to meet the needs of OALWH in resource-constrained settings.

Keywords HIV-NCD integration, HIV, Aging, COM-B model

Background

Globally, the number of adults aging with HIV is growing because of widespread access to antiretrovirals [1]. Projections indicate that by 2040, older adults living with HIV (OALWH) aged 50 years and above will represent 27% of all people living with HIV (PLHIV) in sub-Saharan Africa (SSA) [2–4]. While this trend is a remarkable achievement, people aging with HIV have an increased risk of developing comorbidities due to premature aging and the adverse effects of certain antiretroviral drugs on bone, kidney, liver, and cardiovascular health [5–7]. Prevalent comorbidities in OALWH include hypertension and diabetes, two risk factors for cardiovascular diseases that are responsible for 17 million deaths globally [8–11]. The presence of these comorbidities increases the healthcare needs of OALWH and may complicate service delivery to this population [12].

In sub-Saharan Africa, the burden of hypertension and diabetes among PLHIV, particularly older adults, is an increasing public health challenge. Studies, including meta-analyses, indicate that the prevalence of hypertension among PLHIV in SSA ranges from 18 to 45% [13–17], while the prevalence of diabetes varies from 5 to 15% [18–21]. Because of a siloed healthcare system, the co-occurrence of HIV, hypertension, and diabetes complicates service delivery in SSA [22–24]. In public sector health facilities in SSA, HIV care financing and service delivery have historically been separated from the management of non-communicable diseases (NCDs) [25–27]. Because of this disease-focused organization of funding and care delivery, the majority of healthcare systems in SSA have developed specialized expertise in the health workforce, independent databases, and siloed supply chain processes for medication and commodities. However, as the life expectancy of PLHIV increases, the emergence and burden of NCDs present a complex situation that demands a comprehensive and integrated approach to care [28–30]. The models of HIV/NCD care integration in SSA are diverse within and between countries. In some countries, NCD care has been integrated into HIV care clinics; in others, HIV care was introduced into primary healthcare facilities offering NCD care, while others introduced new clinics that simultaneously incorporated HIV and NCD services [24, 31, 32].

These integrated approaches to care hinge on the behaviors and perspectives of healthcare providers, who play a pivotal role in the implementation and

sustainability of such initiatives. Understanding the facilitators and barriers perceived by healthcare providers regarding the integration of NCD care within HIV clinics using the Capabilities (C), Opportunities (O), and Motivation (M) models for behavior change (COM-B model) of behavior change could offer insights on how to tailor the integration of services. The COM-B Model, developed by Michie et al., offers a comprehensive framework for understanding behavior change by elucidating the interplay between capability, opportunity, and motivation [33]. In the context of HIV/NCD care integration [34], the capability domain delves into the psychological and physical capacity that includes the knowledge and skills required for effective service delivery, whereas the opportunity domain explores external factors such as resource availability and organizational support for the integration of care services. Motivation, the third domain, unravels the intrinsic and extrinsic incentives influencing healthcare providers' attitudes and practices regarding integration [33].

This study utilizes the COM-B model as a theoretical lens to analyze the perspectives of HIV healthcare providers in Eldoret, Kenya, on the integration of HIV and NCD care. By leveraging this framework, which has been successfully applied to inform behavior change interventions in HIV care setting [34–36], we uncover the drivers and barriers shaping the behavior of healthcare providers in relation to HIV and NCD care integration, acceptance, adoption, and implementation. The insights gained from this exploratory study hold the potential to inform tailored interventions, policy decisions, and capacity-building initiatives aimed at fostering successful integration and improving overall health care delivery to meet the needs of OALWH in resource-constrained settings.

Methods

Study design

This qualitative study employed an exploratory research approach to gain in-depth insights into the perspectives of healthcare providers involved in HIV care in the Academic Model Providing Access to Healthcare (AMPATH) at Moi Teaching and Referral Hospital (MTRH) in Eldoret, Kenya. The chosen methodology allowed for a nuanced exploration of the facilitators and barriers to the integration of NCD care services within the HIV care platform to meet the needs of OALWH.

Study setting

This study was conducted at the MTRH, Eldoret, and nested in the AMPATH program. The AMPATH program provides comprehensive HIV care services in more than 500 Ministry of Health (MOH) facilities in western Kenya and serves a catchment population of nearly 20 million people. AMPATH is the largest program providing free HIV care and treatment in Kenya, has enrolled over 200,000 PLHIV, and currently provides antiretroviral therapy (ART) to over 120,000 patients, 30% of whom are OALWH [37, 38]. HIV service delivery at AMPATH is largely provided by clinical officers (mid-level healthcare providers similar to a physician's assistant in the United States) who have diploma-level training to provide basic diagnosis and management of common ailments. Clinical officers in HIV clinics are responsible for initiating and managing ART, monitoring patient adherence to treatment, and managing opportunistic infections and other complications of HIV infection. Nurses staff triage clinics and are responsible for taking vital signs and prioritizing patients based on their medical needs.

In AMPATH's highest-volume HIV clinic site, based on MTRH, HIV care services are provided within comprehensive care clinics (CCCs), while services for other chronic diseases are provided in specialized clinics by another group of providers. This requires that PLHIV with chronic conditions other than HIV be referred from an HIV clinic to one or more specialty clinics.

PLHIV receive HIV and TB medications and viral load monitoring tests are free of charge. However, fees are charged for non-HIV and TB medications as well as for diagnostic and monitoring tests. Although NCD medications are reliably available through the AMPATH revolving fund pharmacy (RFP) [39, 40], a backup supply chain that has largely eliminated stockouts, patients still incur out-of-pocket expenses to procure NCD medications.

Study participants

This study targeted 19 healthcare providers (11 clinical officers and eight nurses) that staffed the AMPATH HIV clinic at the MTRH facility. Healthcare workers were eligible to participate if they were providing routine care services to PLHIV at the AMPATH's MTRH facility and had done so for at least one year (all 19 participants were eligible based on these criteria). The one-year duration was chosen to ensure that HCP had experience with clinical and patient flows in order to offer their perspectives on integration. The inclusion criteria comprised nurses and clinical officers actively engaged in providing HIV care, ensuring a diverse representation of roles within the healthcare team. Healthcare providers who were on leave during the data collection period (two providers, a nurse and a clinical officer) were excluded from this

study as they were not within Eldoret at the time of the interviews.

Recruitment of study participants

Trained research assistants approached potential participants on less busy days at AMPATH clinics, mostly Friday, because clients are not routinely scheduled for clinic visits on this day, and interviews on this day would minimize the disruption of service delivery. Participants were informed about the study and those who were eligible and agreed to participate were recruited for the study. All participants who met the inclusion criteria agreed to participate in this study. Interviews were scheduled at the convenience of the participants and were conducted in a clinic exam room to ensure privacy and confidentiality.

Data collection

All interviews were conducted between January and February 2022. Two university graduate research assistants, one male and one female, both certified in human subject protection and with prior experience in qualitative interviews, conducted in-depth interviews. The following participant demographics were captured: age (categorized as 21–25; 26–30; 31–35; 36–40; 41–45; and >45 years), cadre (nurse or clinical officer), number of years providing HIV care services (less than or equal to 5 years and more than 5 years), and sex (male or female). Interviews were conducted using a semi-structured interview guide with questions focusing on participants' experiences providing care to OALWH and their perceptions about integrating hypertension and diabetes care services into the HIV care platform. Probes related to adherence to medication and clinic visits, management of comorbidities, assessment of the patient's understanding of instructions, and length of time taken to provide care for OALWH are also discussed. The interviews lasted between 42 and 78 min. All interviews were conducted in English and audio was recorded. After the interview, each participant was remunerated with 700 Kenya shillings (USD 7) for the time spent during the interview. As the data collection continued, memoing and analysis were conducted. While we intended to conduct interviews with 17 eligible participants, during the interview process, we reached data saturation after the 10th interview, as no new significant themes or insights emerged from subsequent interviews. Consequently, we chose not to proceed with the remaining seven participants. This early saturation was likely due to the participants' extensive experience in providing care to people living with HIV, which contributed to a high level of uniformity in their responses and insights.

Table 1 Characteristics of participants

Characteristic		Nurses (N)	Clinical Officer (N)	N (%)
Age	31–35 years	1	1	2 (20)
	36–40 years	1	3	4 (40)
	41–45 years	0	2	2 (20)
	> 45 years	1	1	2 (20)
Years of experience in HIV care	≤ 5 years	2	0	2 (20)
	> 5 years	1	7	8 (80)
Sex	Male	1	4	5 (50)
	Female	2	3	5 (50)

Data management and analysis

Audio recordings of the in-depth interviews were transcribed verbatim. All transcripts were uploaded to NVIVO version 10 for coding. Content analysis was used to assess the facilitators and barriers to integrating HIV and NCD care services [41]. In terms of coding, we first applied content analysis by coding specific barriers and facilitators that emerged from transcripts. These codes were then categorized and mapped to the relevant domains within the COM-B model [33]. Thematic analysis was used to identify patterns and underlying themes related to healthcare providers’ experiences and perceptions. This approach allowed us to capture the depth and complexity of qualitative data, revealing insights into how various factors influence the integration of care from healthcare providers’ perspectives. To ensure the validity of our findings, member checks were performed by sharing the coded data with study participants to ensure that our interpretations were aligned with their perspectives. Additionally, the coding process was conducted by two people (JK and a consultant coder) and any discrepancies between the two coders were discussed and resolved by a third member (VN) of the research team. We adhered to recognized criteria and standards for reporting qualitative research and maintained an audit trail of the coding process to ensure the credibility and trustworthiness of the study [42, 43].

Results

Characteristics of the participants

We interviewed 10 healthcare providers (seven clinical officers and three nurses) with equal gender distribution. All clinical officers had provided care services to HIV patients in the AMPATH program for more than five years, while the two nurses had less than five years of experience in the HIV clinic. Table 1 summarizes these characteristics.

Facilitators and barriers to integrating NCD (hypertension and diabetes) care into the HIV clinics

The majority of participants had experience in managing OALWH and identified challenges with the lack of

Table 2 Summary of facilitators and barriers to integrating NCD care into HIV clinics mapped within the COM-B constructs

COM-B Constructs		Themes
Capability	Facilitator	• Training programs to enhance knowledge and skills
	Barrier	• Self-perception of competency • Lack of guidelines for integration
Opportunities	Facilitator	• Physical infrastructure and resources • Ability to leverage PEPFAR funding
	Barrier	• Inadequate resource allocation for NCDs • Facility organization
Motivations	Facilitator	• Motivation to provide holistic care • Buy in and leadership support
	Barrier	• Perceived increased workload

coordinated care delivery for HIV and NCDs. The participants highlighted the potential challenges of optimal adherence to ART among OALWH in the presence of multiple chronic conditions and possible polypharmacy. Based on these challenges, participants perceived the integration of hypertension and diabetes care into the HIV care platform to be beneficial to clients and the overall healthcare system. Integration was viewed as an important factor in promoting adherence to medication, engagement, and interactions with OALWH as well as the potential to improve health outcomes. Participants also identified well-coordinated service delivery and resource optimization as potential benefits. However, the participants identified that additional training and resources were needed to facilitate the integration of care services. Below, we present the perceived facilitators and barriers to integrating hypertension and diabetes care into HIV clinics, as identified by healthcare providers and structured within the COM-B model framework. See Table 2.

Capability for integration of NCD care into HIV clinics

Training programs to enhance knowledge and skills

Several participants noted the need for additional training to effectively manage NCDs. Participants who had been in HIV care for more than 5 years and had developed specialized expertise in HIV care delivery expressed the need for training in NCD care for PLWH, especially OALWH, who have an increased risk of NCDs. They highlighted the importance of continuous professional development that enhances providers’ knowledge on the interactions among aging, HIV, and NCDs in OALWH. The participants also noted that there are ongoing HIV-specific in-service training programs for HIV care providers. However, these in-service trainings focused more on ART delivery, with some focusing on discussing complex patients, including the management of emerging issues in aging with HIV and how to tailor care to the needs of such patients. Advanced practice

clinical officers' (APCO) training was cited as an available resource to build capacity in NCD management for clinical officers to meet patients' NCD needs.

"In my opinion, the major gap is knowledge gap, most health workers deal with HIV so it means that if you were to integrate diabetes and hypertension, then training will be needed, health care workers have to be trained on CDM (chronic disease management), I think training would be key if we are to achieve this integration just like the continuous training in HIV." Male CO-7.

"Every Friday morning, we have CMEs (continuous medical education) that allow us to discuss complex patients. We have discussed older patients and how their medication may need adjustments because of other conditions they have developed. This has been helpful in ensuring that we all learn from each other and how best to offer care. But if we had an opportunity to attend the APCO training, that will be good because I will build my skills and knowledge for managing HIV and chronic comorbidities." Female CO-2.

Self-perceptions of competency

Participants in this study, particularly clinical officers, were not confident in their clinical skills in managing both HIV and NCDs. They conveyed the feeling of being inadequately equipped with the necessary knowledge and expertise to provide care for NCDs. Clinical officers who had worked in HIV clinics for more than five years felt that they had developed specialized expertise in HIV and opportunistic infections care and were less confident in managing NCDs. They especially voiced the complex healthcare needs of OALWH with concurrent NCDs and other geriatric syndromes common to people with HIV. On the other hand, nurses were confident in their skills to screen for hypertension among PLHIV and felt empowered by their knowledge and skills in NCD screening.

"You know, there are cases that you can manage, but because the knowledge that you have on management of hypertension is from back then in college, you will think of maybe, 'Why don't you refer them to a consultant?' This place being a referral hospital, there is a physician who will take care of them." Male, CO-5.

"...at the nurse station, we take vital signs such as pulse rate, body temperature, respiratory rate and also blood pressure measurements.....we do this all the time and it is our routine service. BP measurements are already available for screening for hypertension" Female Nurse-1.

Lack of guidelines for integration

Although there are clear guidelines available for the management of HIV, Clinical Officers have expressed challenges in managing HIV in older adults, especially when they present with other comorbid conditions. Participants acknowledged that HIV infection and NCDs have distinct treatment protocols, diagnostic criteria, and monitoring measures, and expressed challenges in navigating the complexity of ensuring adherence to both sets of guidelines. They also noted that the current HIV treatment guidelines do not address issues related to treating older adults, and they reported that there is no consensus on which specific ART regimens are more effective or better tolerated by OALWH. The lack of standard protocols to guide practice limits the potential for integrating services.

For the guidelines specifically, it doesn't give a clear guidance, for the elderly (older adults). It just says 15 years and above without any cut off. We usually treat them like 15 years and above without discriminating them. Because, the guideline is not clear we just treat them as such.

Female CO-4.

"I think also the team at diabetes clinic don't understand the drug interaction with the drugs. Some of the ARVs drugs like dolutegravir, it interacts with Metformin. If the team at diabetic clinic don't know this, they will not adjust the meds. But if there were guidelines in place, or if both HIV and diabetes was offered here, we will even know how we can adjust the doses... It is just the channel of communication, yes, like you don't know who is there." Male CO-3.

Opportunities for integration of NCD care into HIV clinics

Physical infrastructure and resources that would support HIV/NCD integration

Physical infrastructure and resources that would support HIV/NCD integration

The participants outlined some of the infrastructure necessary to support the care and treatment of NCDs and to promote the integration of services. These included: (i) blood pressure monitoring machines; (ii) an onsite laboratory that is equipped to offer tests for monitoring the impact of diabetes and HTN on the patient; (iii) an electronic medical records system (such as AMPATH medical records system) that has the potential to interface with other databases, and is equipped with a point-of-care system with an in-built decision support module that provides alerts and notifications to clinicians; and (iv) pharmacies established within the HIV clinic to ensure continuous access to NCD drugs at an affordable price. The availability of these resources and infrastructure was cited as enablers for the assessment and

management of geriatric conditions and in promoting integrated services at AMPATH.

"We do take vital signs for all patients and this could be used for screening blood pressure among older people. Since a nurse is doing this at the nurse station, they will input the information in the AMRS (AMPATH's EMR system) and the clinician will have access to it, helping in making decisions on how to manage the patient depending on their BP readings.....the research lab is also available to run tests and RFP can dispense drugs, but these all will depend on whether the patient will afford it or not" Male CO-1 "I think AMPATH is in a position to provide care for HIV and hypertension and even diabetes because they have the capacity, the personnel just need continuous training but there is a lot more in place. See, for example, there is the availability of drugs in most of the pharmacies in this hospital and RFP as backup, AMRS (AMPATH medical records system) can be linked with mUZIMA (electronic database for chronic diseases) and we can access previous data for patients, I understand the hospital is even planning a hospital-wide electronic database which could make things easy to integrate. This just need a little work and we are ready to go" Female Nurse-3.

Ability to leverage PEPFAR funding

The participants noted that HIV care providers were supported by the PEPFAR funding. Although the participants mentioned that PEPFAR funding was limited to providing HIV services, they highlighted the potential for leveraging support to track metrics beyond HIV viral load suppression, such as tracking hypertension control in patients with HIV. The tracking mechanism was noted as an opportunity that did not require additional funding but could utilize personnel responsible for programming to build the decision support module into the electronic medical record system to monitor BP measurements of patients with hypertension. Additionally, participants identified that advocating PEPFAR for funding to support the cost of laboratory tests required to monitor patients with NCDs would facilitate integrated services for OALWH.

"sometime back, most of our clients were supported for LFTs (liver function tests) and creatinine and it was so easy to manage patients. Right now, all these tests are footed (paid for) by the patient and as[a] clinician you rarely ask because you know the financial status of the patient. But we can advocate through our leadership to have USAID (PEPFAR) cover these tests again. If this is done, integration

will be really easy and improve our patient monitoring greatly. The clients will feel that everything is now free including the services for diabetes and hypertension, otherwise it would be very difficult to convince them that the HIV is free and the others are chargeable." Male CO-3.

Inadequate resource allocation for NCDs

Participants viewed HIV care as well resourced because of the availability of U.S. President's Emergency Plan for AIDS Relief (PEPFAR) funding that supports diagnostics, treatment, and monitoring of HIV. They expressed concern about the scarcity of NCD-related resources, such as funding support for treatment and monitoring, and pointed to this as a barrier to the effective delivery of integrated care. Participants also.

highlighted OALWH as a group that is at an increased risk of experiencing significant out-of-pocket spending on NCD medications and monitoring because the National Hospital Insurance Fund (NHIF) does not cover these costs.

"Testing and screening will still be a barrier because it has to be paid for, if it is subsidized that will be good, and you see you cannot also screen free of charge, you screen at a cost, so may be that is funded or... funded by the government or anybody it would be of help because you see like most of the patients you tell them to go and screen may be the patient has come with symptoms of diabetes, he's passing urine a lot, very thirsty, you send them for the test and he goes home. When they come the next visit and he tells you he didn't have money to do the test, so that is just a barrier in itself." Male CO-7.

Facility organization

Participants appreciated integrated care models in which the healthcare facility had a well-structured system for cross-collaboration between the HIV and NCD care teams. They highlighted the lack of interoperability between the available databases for HIV and NCD care and noted that linking these databases at AMPATH could offer opportunities for cross-collaboration among healthcare providers. Participants mentioned that patients were likely to have multiple unlinked identifiers, and in cases where a patient visited multiple clinicians, the primary HIV clinician had limited access to care and treatment data from the external provider. While this siloed care delivery affected PLHIV in all age groups, significant effects were observed among OALWH, who were less likely to remember to relay information between clinicians. The institutional separation of care delivery was cited as a barrier to the integration of HIV and NCD care.

"... at times you can't know the regimens these patients are. Even the hypertensive drugs, sometimes you ask the patient and he tells you he doesn't know the name so... You know they take them once maybe but the real name of the drug, they cannot recall and we cannot access that system (separate EMR system for NCDs), ...that could be very easy to know the patients prescriptions and mark you, you cannot send the patient to that clinic that day, the diabetic clinic or hypertensive clinic may not be operating on that day." Female CO-6.

At times you refer a patient to outpatient clinic but they don't go to that place because sometimes they have challenges reaching there, they think we are giving them extra work. And I do know the processes there take time. An old man who was here today, stopped going for his hypertension clinic, and when we ask him why, he told us that there is so much, you are sent back and forth, for tests, and he did not have money. His clinic days are different from the HIV clinic days, and this lack of synchronizing the clinic days can strain the patient financially." Female-CO-4.

Motivation for integration of NCD care into HIV clinics

Motivation to provide holistic care for patients

Our participants held positive beliefs about the benefits of integration, and were motivated to support this approach. They perceived integrated care as a holistic and patient-centered solution that could improve not only the achievement of viral load suppression but also healthy longevity in PLHIV. They expressed concerns about the current care structure, where they are not fully in control of how OALWH are managed outside of the HIV clinics after the diagnosis of an NCD, which will impact the overall health outcomes of OALWH.

"For my colleagues at MTRH, instead of having the same staff waiting for that patient, it will help them decongest even Chandaria clinic, like those patients we will pull them to be here and manage them here. Definitely queue there will reduce and those staff there with not to be overwhelmed. For me, I will fully manage the patient wholesomely." Female CO-2.

"It will reduce lost to follow up rates because when they are referred to another facility to get services, they tend to get lost when searching for the clinic, most of them can give up and stop coming to the clinic which affects our retention rates." Male Nurse-2.

Buy in and support from Leadership

Healthcare providers perceived the leadership of the HIV program as supportive and committed to

patient-centered care. Political will and AMPATH's vision for population health were cited by the participants as facilitators of HIV and NCD care integration to meet the needs of OALWH. The AMPATH population health model, developed to address the social determinants of health, provides a framework for sustainable programs that improve the health outcomes of the population while considering the unique needs of OALWH. Participants also highlighted AMPATH's move to universal health coverage, part of the population health model, as an area that has the potential to benefit OALWH.

"The program is continuing to evolve and we now hear of population health and UHC (universal health coverage). To be honest, this is the right direction. If our clients especially those with comorbidities are fully covered within the ongoing UHC efforts, integration will be easy. The leadership led by John and Jane (not their real names) is also working hard to ensure that we are achieving our third 95 target (95% of people on HIV treatment achieving viral load suppression) and this all depends on how we are managing our patients with other conditions as this has an impact on being suppressed you know.... So yes, I think we have good leadership that want the best for our patients too." Male CO-7.

Perceived increased workload

Nurses did not raise increased workload as an issue since they identified their role at the nursing station to encompass vital signs monitoring, for example, BP measurement, an aspect that could be leveraged for screening. However, clinical officers expressed that the integration of NCD services, especially for hypertension and diabetes, into HIV care would add to their already high workloads. They reported that the average number of clients (30–40 per day) currently seen by each clinician is overwhelming. In particular, participants reported that integrated management of HIV/NCD for OALWH would require more time than that needed for managing younger adults, as OALWH take time to express themselves and at times require more support to access other services in the clinic.

"..you will spend a lot of time, for the elderly (older adult) patients as compared to the younger generation (young people), ... as they come to clinic. They do things so slowly, even telling you what the problem is.... Now, when explaining the medication, even when it is ART and say TB drugs, you have to repeat it over and over again before they get it. Now you can imagine what will happen if you add all the other medications for hypertension, diabetes...and then, they often come alone. It is always helpful when they

come with someone, but many times they don't. So, you sometimes need to assist, you stop the things you are doing, and go and pick medication for the client... that again takes a longer time." Male CO-1.

"taking care of older people can take time. They present with so many conditions, meaning one has to spend more time with them getting medical history. In an environment like ours where you have to take care of so many patients, this is a lot " Female CO-2.

Discussion

Leveraging the existing HIV infrastructure to deliver NCD care for OALWH is an effort to save time and costs for clients by establishing a one-stop shop for care delivery [44]. This study explored the capabilities, opportunities, and motivations for integrating NCD care services into HIV clinics for OALWH in the AMPATH clinic in western Kenya. Factors such as the availability of physical resources and infrastructure, leadership support, motivation to provide person-centered care, and availability of training opportunities for NCD care were identified as facilitators for integration. Impeding factors, such as lack of guidelines for integration, perceived increased workload, siloed care delivery, and inadequate resource allocation for NCDs, were identified. Although similar factors have been identified in studies evaluating integration within Eastern Africa [22, 45–47], our focus on OALWH who are at a higher risk of developing chronic comorbid conditions, including our approach to assessing these factors within the framework of the COM-B model, is unique and may inform targeted interventions for HIV/NCD-integrated care.

Our findings indicate that healthcare providers perceive continuous training programs as key facilitators as they enhance providers' capabilities to deliver integrated care effectively. Highlighted by other studies in SSA, continuous in-service education not only equips providers with the necessary skills but also boosts their confidence, enabling them to manage both HIV and NCDs proficiently [23, 46]. A study that introduced integrated care for hypertension and diabetes from a single point of care in Uganda and Tanzania also reported that providers felt competent in managing both HIV and NCDs and were more likely to embrace integration [48]. However, in our study, the clinical officers who had worked within HIV clinics for longer periods felt that their competence was low, reflecting their lack of capability, which in turn acts as a barrier to integrated care. This barrier highlights the importance of establishing a cadre-specific training program tailored to unique responsibilities and challenges in managing people as they age with HIV and the need for patient-centered care. Coupled with supportive supervision to boost confidence, training may increase clinician competencies in providing integrated care. Nurses, on

the other hand, perceived their competency to screen for hypertension within HIV clinics as high as they offered this service routinely to PLHIV, and the experience over time likely influenced this perception.

Furthermore, the availability of supportive infrastructure and resources is crucial in facilitating integrated care [45]. Similar to our study, other studies, including a study in Uganda and a systematic review that assessed health system facilitators and barriers to integrating HIV and chronic disease services, identified that adequate diagnostic tools, medication, and equipment for both HIV and NCD care significantly enhance the capacity of providers to deliver integrated HIV-NCD care [46, 48]. The insufficient allocation of resources to NCD care presents a formidable barrier that limits the physical opportunities for healthcare providers to deliver integrated care effectively [47]. Resource distribution disparities highlighted by participants in our study demand a reevaluation of resource allocation strategies and emphasize the importance of equitable distribution of resources to meet the evolving dual demand of HIV and NCD as people age with HIV [30]. In addition, the existence of a siloed care system, common in the majority of SSA countries, where HIV and NCD care are treated separately, acts as a substantial barrier. Such fragmented systems limit opportunities for collaboration and integration of care. Overcoming this barrier requires organizational changes to create opportunities for cross-collaboration and resource sharing, as suggested by other studies conducted in resource-limited settings [45, 46, 49]. The absence of clear guidelines for integration presents a challenge to healthcare providers, and the development or availability of guidelines and policies that support integration is crucial for overcoming this barrier [23, 47, 50]. Conversely, participants in our study perceived PEPFAR's broad mandate and financial support as an invaluable resource that could be strategically utilized to strengthen integrated care efforts [30, 51]. Providers expressed optimism about the potential of leveraging existing HIV platforms to bridge the gaps in NCD care. This facilitator underscores the importance of aligning funding strategies with the evolving healthcare landscape and tapping into existing resources to effectively support the integration of HIV and NCD care.

Providers' perceptions of the benefits of integration have also been documented as motivators for integration [44, 45]. When healthcare providers recognize positive outcomes such as improved patient care, reduced out-of-pocket spending, and streamlined processes, it becomes a driving force for integration [45, 52]. Belief in these benefits motivates healthcare providers to actively engage in integrated care. In addition, leadership that provides a clear vision, empowers providers, allocates resources, and fosters a culture of collaboration and innovation

significantly impacts the motivation of healthcare providers [46, 47]. Psychological and emotional support from supportive leadership encourages healthcare providers to embrace change and work cohesively. The limited availability of resources for NCD care represents a significant barrier that directly affects the capacity of healthcare providers [47]. Studies conducted in Africa that include Uganda and Tanzania have documented that, when healthcare facilities lack the necessary resources for NCD management, they hinder their ability to provide effective integrated care [22, 46, 50]. Addressing these barriers will, therefore, require resources to be allocated and infrastructure to be developed, capacitating the integration of HIV and NCD service delivery.

This qualitative study, involving interviews with 10 HIV care providers to assess facilitators and barriers to integrating hypertension and diabetes care into the HIV care platform, has some limitations. A sample size of 10 may be perceived as relatively small and may not fully capture the diverse perspectives and experiences of the entire healthcare workforce providing HIV-care services. While research has shown a high prevalence of other NCDs, including mental health disorders [53], our study explored the integration of diabetes and hypertension services and planned to explore other NCDs in the future. Despite these limitations, this study allowed for an in-depth exploration of healthcare providers' perspectives, offering rich insights into the enablers and barriers to HIV, diabetes, and hypertension care integration. The COM-B model provides a framework for understanding the complex dynamics influencing integration and facilitates the identification of targeted interventions by delineating the areas of capability, opportunity, and motivation that impact integration efforts.

Conclusion

The findings from this study underscore the importance of leveraging the existing HIV infrastructure to integrate NCD care, particularly for OALWH, and highlight several areas for future research, practice, and policy development. Our findings indicate that efforts should be made to develop standardized guidelines and training programs that equip healthcare providers with skills and knowledge to manage both HIV and NCDs in an integrated care setting. Although we acknowledge that additional research is needed to identify the optimal strategies for integration of services, policymakers can facilitate efforts toward integration by prioritizing the development of comprehensive policies that promote HIV/NCD integrated care. This includes ensuring adequate resource allocation for NCD care within HIV programs and creating clear actionable guidelines to support healthcare providers in delivering integrated services.

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Authors' contributions

JK conceptualized the idea and wrote the first draft of the manuscript. KWK, VN, SP, JHK, and RV provided critical input for all drafts and approved the final version of the manuscript.

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Data availability

Data from this study contain information that may compromise the confidentiality and privacy of the participants. However, requests made to the corresponding author are considered appropriate. Requests can be submitted to the corresponding author at chiri2809@gmail.com.

Declarations

Ethics approval and consent to participate

The study was approved by the Moi Teaching and Referral Hospital/Moi University Institutional Research Ethics Committee (FAN:0003889) and received exempt reviews from Indiana University IRB (Protocol #11922) and the University of Washington IRB (STUDY 00013910). Research clearance was obtained from Kenya's National Council for Science, Technology, and Innovation (NACOSTI/P/21/11258) before initiating the study. Written informed consent was obtained from all participants before their participation in the study.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

¹Academic Model Providing Access to Healthcare, Eldoret, Kenya

²Moi University, School of Public Health, Department of Epidemiology and Medical Statistics, Eldoret, Kenya

³Moi University, School of Arts and Social Sciences, Department of Psychology, Anthropology, and Sociology, Eldoret, Kenya

⁴Moi University, School of Medicine, Department of Internal Medicine, Eldoret, Kenya

⁵New York University, Grossman School of Medicine, Department of Population Health, New York, USA

⁶Purdue University College of Pharmacy's Center for Health Equity and Innovation, West Lafayette, IN, USA

⁷Indiana University, School of Medicine, Department of Medicine, Indianapolis, IN, USA

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