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Otieno, P. orcid.org/0000-0001-6828-8301, Agyemang, C., Wainaina, C. et al. (5 more authors) (2023) Perceived health system facilitators and barriers to integrated management of hypertension and type 2 diabetes in Kenya: a qualitative study. *BMJ Open*, 13 (8). e074274. ISSN 2044-6055

<https://doi.org/10.1136/bmjopen-2023-074274>

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BMJ Open Perceived health system facilitators and barriers to integrated management of hypertension and type 2 diabetes in Kenya: a qualitative study

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To cite: Otieno P, Agyemang C, Wainaina C, *et al*. Perceived health system facilitators and barriers to integrated management of hypertension and type 2 diabetes in Kenya: a qualitative study. *BMJ Open* 2023;**13**:e074274. doi:10.1136/bmjopen-2023-074274

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2023-074274>).

Received 31 March 2023
Accepted 28 July 2023



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ABSTRACT

Objective Understanding the facilitators and barriers to managing hypertension and type 2 diabetes (T2D) will inform the design of a contextually appropriate integrated chronic care model in Kenya. We explored the perceived facilitators and barriers to the integrated management of hypertension and T2D in Kenya using the Rainbow Model of Integrated Care.

Design This was a qualitative study using data from a larger mixed-methods study on the health system response to chronic disease management in Kenya, conducted between July 2019 and February 2020. Data were collected through 44 key informant interviews (KIs) and eight focus group discussions (FGDs).

Setting Multistage sampling procedures were used to select a random sample of 12 study counties in Kenya.

Participants The participants for the KIs comprised purposively selected healthcare providers, county health managers, policy experts and representatives from non-state organisations. The participants for the FGDs included patients with hypertension and T2D.

Outcome measures Patients' and providers' perspectives of the health system facilitators and barriers to the integrated management of hypertension and T2D in Kenya.

Results The clinical integration facilitators included patient peer support groups for hypertension and T2D. The major professional integration facilitators included task shifting, continuous medical education and integration of community resource persons. The national referral system, hospital insurance fund and health management information system emerged as the major facilitators for organisational and functional integration. The system integration facilitators included decentralisation of services and multisectoral partnerships. The major barriers comprised vertical healthcare services characterised by service unavailability, unresponsiveness and unaffordability. Others included a shortage of skilled personnel, a lack of interoperable e-health platforms and care integration policy implementation gaps.

Conclusions Our study identified barriers and facilitators that may be harnessed to improve the integrated management of hypertension and T2D. The facilitators should be strengthened, and barriers to care integration redressed.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This study triangulated perspectives from multiple stakeholders including healthcare providers, patients and policymakers to understand the barriers and facilitators to the integrated management of hypertension and type 2 diabetes (T2D) in Kenya.
- ⇒ The use of the Rainbow Model of Integrated Care enabled the identification of the facilitators and barriers of integrated care for hypertension and T2D at different levels of the health system in Kenya.
- ⇒ Our results cannot be generalised to all patients with hypertension and T2D but may generate hypotheses for further research on integrated care in Kenya.
- ⇒ The findings are based on self-reports and may therefore differ from actual health service delivery for hypertension and T2D in Kenya.

BACKGROUND

Hypertension and type 2 diabetes (T2D) are the leading global risk factors for cardiovascular diseases.¹ In Kenya, 3% of adults have impaired fasting glycaemia and 25% live with hypertension.² People living with hypertension and T2D often have multiple rather than a single condition, commonly referred to as multimorbidity.³ This implies a shift in primary healthcare services away from single disease-focused, towards integrated care.⁴ The WHO defines integrated chronic disease management as the delivery of a continuum of patient-centred services that are based on promotive, preventive, therapeutic, rehabilitative and palliative interventions coordinated within and beyond different health sectors throughout the life course.⁵ The aim of integrated care is to promote collaboration and coordination among different healthcare providers such as primary care physicians, specialists, nurses and allied health professionals, to deliver seamless and continuous care across different care settings.^{6 7}



Several integrated care frameworks exist in the global literature.^{5 8–10} However, the conceptual ambiguity of integrated care poses a significant challenge in understanding the gaps in the implementation of integrated care. Developed and validated through systematic reviews and the Delphi method,^{11–13} the Rainbow Model of Integrated (RMIC) care provides a detailed description of integrated care that emphasises on consolidation of various healthcare components into a single ‘one-stop-shop’ setting, where individuals with chronic conditions can receive comprehensive care that includes medical, behavioural and social support. Broadly, the RMIC cover three main domains including macro-environment, meso-environment and micro-environment.^{5 8–10} The macro-environment comprises legislative, policies, governance and financial structures. The meso-environment involves collaboration among multifunctional and interdisciplinary teams or organisations in delivering integrated care. The micro-environment consists of the frontline health service delivery elements including the design, clinical practices and chronic care models. Although the macro-environment, meso-environment and micro-environment are crucial elements of the integrated care framework, they have not been considered extensively by previous studies.

The key challenges to the management of hypertension and T2D comorbidity in sub-Saharan Africa (SSA) include high treatment burden, polypharmacy, poor coordination, linkage and continuity in care, inadequate access to essential medicines and poor adherence to treatment.^{14–16} Most studies on the integrated management of hypertension and T2D in Kenya have focused on aggregated output measures such as service delivery indices.^{17–19} However, such measures may not provide information on the practice of health service providers and patient experiences. In line with the WHO and the RMIC, we defined and operationalised integration as a ‘one-stop-shop’ model where people living with hypertension and T2D receive all essential healthcare services under one roof by one or more service providers. This included prevention, diagnosis, treatment and follow-up. Our 2019 nationwide services availability and readiness assessment survey revealed the low readiness of public primary health facilities in Kenya to provide integrated care services for hypertension and T2D.²⁰ Thus, understanding the facilitators and barriers to the management of hypertension and T2D will inform the design of a contextually appropriate integrated chronic care model in Kenya. In this study, we explored the facilitators and barriers to the integrated management of hypertension and T2D in Kenya using the RMIC.

METHODS

Study design

Data reported in this study are part of a larger mixed-methods study on the health system response to chronic disease management in Kenya, conducted between July

2019 and February 2020.²¹ A qualitative approach, based on phenomenological study design,²² was used to gather participants’ views and experiences on integrated management of hypertension and T2D. A phenomenological approach is a type of qualitative enquiry that focus on lived experiences of individuals by exploring the meaning of a phenomenon while gaining a deeper understanding of the phenomenon.²³ The main goal of the phenomenological approach is to identify a phenomenon by how it is perceived by those with lived experiences.²²

Research participants

The research participants comprised frontline health workers such as medical doctors, clinical officers, nurses, pharmacists and laboratory technologists. The following criteria had to be met for participation: (1) the healthcare professionals should have worked for at least 1 year in a health facility with a good understanding of the facility’s capacity and chronic diseases related services provided by the facility; (2) the healthcare professionals should have voluntarily been willing to participate in the study and able to provide information related to the management of hypertension and T2D. Other participants included patients with hypertension and T2D who sought care for at least 1 year in the facilities located in the study counties. County health managers, non-communicable disease (NCD) policy experts and representatives from non-state service delivery organisations were also interviewed. The rationale for interviewing diverse stakeholders at multiple levels was to allow for an exploration of multiple perspectives on the availability and challenges of implementing integrated management of hypertension and T2D defined as a ‘one-stop-shop’ model with all essential healthcare services under one roof.

Sampling and recruitment procedures

Multistage sampling procedures²⁴ were used to select a total of 12 study counties in Kenya from six main regions namely Nairobi, Central, Coast and North Eastern, Eastern, Nyanza and Western and Rift Valley (see online supplemental file 1). In the first stage, two counties (subcounties in the case of Nairobi) were selected in each region. The counties were then sampled with probability proportional to size, with size being the total number of healthcare facilities. The 12 randomly selected study counties included Kisumu, Nyamira, Mombasa, Wajir, Baringo, Narok, Kitui, Embu, Kirinyaga, Kiambu and two subcounties in Nairobi (Dagoretti and Starehe). However, Wajir, a county neighbouring the conflict-prone Kenya–Somali border was excluded from the qualitative interviews due to insecurity. More details of the sampling methods have been published elsewhere.²¹ In total, 11 health managers from each of the participating counties were purposively selected to participate in the key informant interviews (KIIs). In addition, 24 healthcare workers from each level of health facility in the participating counties were also purposively selected to participate in the KIIs. Details of the facility levels have been published elsewhere.²⁰

Other study participants for the KIIs comprised five purposively selected policymakers from the NCD division of the Ministry of Health, Kenya and four key persons from non-governmental organisations (NGOs) implementing programmes on hypertension and T2D at the national level. Five focus group discussions (FGDs) were also conducted among purposively selected patients with hypertension and T2D in the study counties (one FGD per region) and an additional three FGDs with patient support groups for hypertension and T2D in Nairobi County.

Data collection methods

Data were collected via key KIIs and FGDs. The participants discussed the facilitators and barriers in delivering and accessing integrated management of hypertension and T2D in Kenya. The key informants were selected for their expertise in primary healthcare service for hypertension and T2D. The FGDs were used to supplement the KIIs because they give participants an opportunity to reflect on other participants' views while building on their views.²⁵ The interviews were facilitated by 11 qualitative research assistants from the respective study counties. The research assistants were trained for 5 days before conducting the interviews. The training covered the objectives of the study, question-by-question explanation of the contents of the interview guides and standard operating procedures during field interviews. The training also comprised practical sessions involving role-playing in which the research assistants practised interview sessions with each other as expert respondents.

The FGDs were moderated by a trained qualitative research assistant alongside a note-taker. Each session included 8–10 participants and lasted between 1 and 2 hours. Sessions began with brief introductions followed by a discussion on the facilitators and barriers in accessing integrated management of hypertension and T2D in Kenya. The discussants expressed their ideas, beliefs, personal experiences and concerns about access to integrated healthcare services for hypertension and T2D. All the interviews were held at venues chosen in consultation with the participants. The KIIs with frontline health workers, county health managers, policy experts and representatives from non-state service delivery organisations were conducted in English and lasted about 1 hour. The FGDs with patients living with hypertension and T2D were conducted in Kiswahili or a local language depending on the participant's preference to minimise the language barrier.

Research instruments

Open-ended thematic interview guides were used for all the KIIs and FGDs (see online supplemental file 2). The design of the instruments ensured coverage of similar themes with in-built flexibility for the flow of questions to allow probing of the pertinent issues during the interviews. The interviews consisted of questions, aiming to understand the gaps, barriers, enabling and reinforcing factors

in delivering integrated care for hypertension and T2D at the primary care level. The items in the KIIs and FGDs were developed based on the concepts of WHO building blocks for health systems.²⁶ The questions focused on the elements of care integration following RMIC²⁷ and the routine management of hypertension and T2D based on the six building blocks of primary healthcare, namely health service delivery, health workforce, health information systems, access to essential medicines, health systems financing, leadership and governance.

Conceptual framework

The elements of care integration were identified and presented following the RMIC²⁷ shown in figure 1. The RMIC is a validated framework that enables a comprehensive evaluation of care integration elements across the micro, meso and macro levels of a healthcare system.²⁷ The micro-level focuses on clinical integration comprising coordination of care activities across conditions, health service providers and primary care settings. The meso-level is based on organisational and professional integration such as collaboration by health service providers and sharing of roles, responsibilities and competencies. The macro-level focuses on systems integration comprising healthcare services linkages through rules and policies. The three levels of care integration are linked together by functional and normative integration. Functional integration refers to support functions such as financial, and information management systems. Normative integration comprises a common shared vision, values, mission and culture that promote care integration.

Data analysis

The audio-taped recordings were transcribed verbatim alongside handwritten notes. The transcriptions of interviews conducted in languages other than English were translated into English. Data verification for accuracy and completeness was done by reading and rereading the interview transcripts and listening to the audio for clarity. The interview transcripts were reviewed and exported to Nvivo V.12 software for coding. Deductive and inductive thematic analysis were used to deduce the over-reaching themes based on the core elements of the RMIC.²⁸ First, three research team members (PO, EOAW and JO) conducted the coding of the transcripts to identify themes, messages and patterns emerging from the data. Codes were developed and matched to ensure integrity and similarity between the researchers. A codebook was developed after the integration and collation of the identified codes. Two similar transcripts were coded with constant comparison of the data among the researchers and then discussed to establish agreement before coding all the transcripts.²⁹ Coding of the transcripts was an iterative process among the researchers and refining of the codebook was done during the process to maintain data accuracy. From the codebook, broader themes and subthemes that emerged from the data were identified

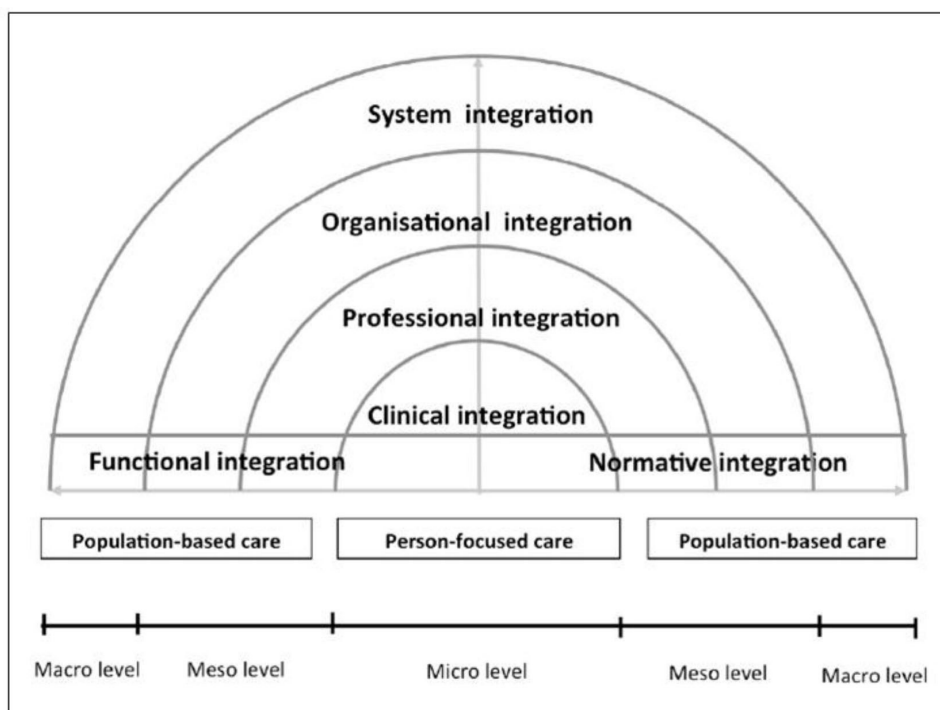


Figure 1 Conceptual framework. Adapted from Valentijn *et al* 2015.¹³

and reviewed to ensure they were appropriate for the interpretation.

Patient and public involvement

Patients and/or the public were not involved in the design, conduct, reporting, or dissemination of this research.

RESULTS

Distribution of the study participants

Table 1 shows the characteristics of the study participants. In total, 44 participants comprising of 27 males and 17 females participated in the KIIs. The participants for the

	Male	Female	N
KIIs, n=44			
National policymakers	4	1	5
County health managers	8	3	11
County health service providers	12	12	24
Directors of NGOs implementing hypertension and T2D programmes	3	1	4
Total	27	17	44
FGDs, n=8			
Patients with hypertension and T2D (5 FGDs)	20	37	57
Patient support groups (3 FGDs)	5	20	25
Total	25	57	82

FGDs, focus group divisions; KIIs, key informant interviews; NGOs, non-governmental organisations; T2D, type 2 diabetes mellitus.

KIIs comprised frontline healthcare workers (medical doctors, clinical officers, nurses, pharmacists and laboratory technologists) and county health managers. Other study participants included national policymakers and key persons from NGOs implementing hypertension and T2D programmes at the national level. The participants for the FGDs comprised 57 male and 25 female patients with hypertension and T2D comorbidity.

Facilitators and barriers to integrated management hypertension and T2D

Various facilitators and barriers to the integrated management of hypertension and T2D were identified and presented in table 2. The results have been presented separately for each dimension of care integration: the micro (clinical integration), meso (professional and organisational integration), macro (system integration) and functional and normative integration (connecting all the levels of integration).

Micro level: clinical integration

Clinical integration refers to the extent to which person-centred care services are coordinated in primary care settings. In this study, the clinical integration facilitators broadly included patient-centred care models such as peer support groups and health education and promotion on shared risk factors for cardiovascular diseases. The peer support groups were considered by the patients interviewed as important avenues for addressing psychosocial needs and raising awareness of shared lifestyle risk factors for hypertension and T2D. One patient living with hypertension and T2D stated,

Table 2 Facilitators and barriers in delivering integrated management of hypertension and T2D in Kenya

Health system level	Dimension of care integration	Facilitators (+)	Barriers (-)
Micro level	Clinical integration	<ul style="list-style-type: none"> ▶ Patient peer support groups for hypertension and T2D ▶ Health education and promotion on shared risk factors for cardiovascular diseases 	<ul style="list-style-type: none"> ▶ Vertical healthcare services for hypertension and T2D ▶ Lack of basic screening, diagnostic and treatment services for hypertension and T2D in primary care facilities ▶ Unavailability of medication for hypertension and T2D
Meso level	Professional integration	<ul style="list-style-type: none"> ▶ Task shifting ▶ Continuous medical education ▶ Integration of community resource persons such as CHVs 	<ul style="list-style-type: none"> ▶ Shortage of skilled personnel ▶ Inadequate budgetary allocations for in-service training ▶ High attrition rate and poor replacement mechanisms ▶ Shortage of specialists ▶ Unqualified healthcare providers ▶ Inadequate training curricula skewed towards therapeutic interventions
	Organisational integration	<ul style="list-style-type: none"> ▶ Well-established referral systems in public facilities 	<ul style="list-style-type: none"> ▶ Corruption ▶ Conflict of interest
Macro level	System integration	<ul style="list-style-type: none"> ▶ Decentralisation of healthcare services for hypertension and T2D ▶ Multisectoral partnerships ▶ Interdependency in the delivery of integrated management of hypertension and T2D 	<ul style="list-style-type: none"> ▶ Care integration policy implementation gaps ▶ Challenges with the devolution of healthcare services for hypertension and T2D ▶ Inadequate monitoring and evaluation frameworks for care integration programmes
Connecting all the levels of integration	Functional integration	<ul style="list-style-type: none"> ▶ National health management information system (HMIS) ▶ National health insurance fund (NHIF) 	<ul style="list-style-type: none"> ▶ Inadequate budgetary allocations ▶ Lack of NHIF accreditation of most primary care facilities ▶ Unaffordability of healthcare services ▶ Coverage limits for hypertension and T2D by NHIF ▶ Lack of interoperable e-health platforms
	Normative integration	<ul style="list-style-type: none"> ▶ Political goodwill for universal health coverage and integrated care 	<ul style="list-style-type: none"> ▶ Poor leadership

CHV, community health volunteers; T2D, type 2 diabetes.

When I was diagnosed with hypertension and diabetes, I was overweight and never used to care about what I eat. However, I have acted on the health information I received in this facility from the patient support group sessions, especially on the shared risk factors for hypertension and T2D such as diet, exercise and medication adherence and my sugar levels and blood pressure are now controlled within the normal range. (Patient FGD participant).

The support group forums provided a platform for sharing experiences and dealing with similar types of health and personal issues and emotional distress. One of the patients living with both hypertension and T2D stated,

I have benefited from the support groups in the sense that I do not have the feeling of being sick alone. We always share our experiences to the point you feel your situation might be even better. When you are alone you can suffer from

a lot of psychological problems. (Patient FGD participant).

The patients also acknowledged feeling more motivated and able to improve their self-care. A sense of self-confidence empowered the patients to take responsibility for their health, with one remarking that,

Being in the support group has enabled me to accept my condition and I am also always free to disclose it to anyone. I am also motivated to adhere to my medication. ((Patient FGD participant).

The major clinical integration barriers identified by the patients and other health stakeholders interviewed comprised vertical and unresponsive healthcare services. One of the NCD experts stated,

The primary care for hypertension and T2D are offered as standalone services in primary care settings even if the patient is living with comorbidities. This results in fragmentation of services that threaten the

holistic perspective of healthcare services. (NCD policy expert).

Unresponsive healthcare services were cited by the patients interviewed as a major limitation for the integrated management of hypertension and T2D. This was characterised by the unavailability of medication for hypertension and T2D, and lack of basic screening, diagnosis and treatment services for hypertension and T2D in primary care facilities. One county health manager stated,

A majority of primary care facilities in our county offer basic screening for hypertension and screening for risk factors such as body mass index, and basic health education and promotion. However, only a few higher-level facilities might be able to provide blood sugar tests and treatment for T2D. (County health manager).

According to one primary care facility in-charge interviewed, the supply-side gaps in essential medicine for hypertension and T2D had perceived cross-cutting effects at the patient level such as poor medication adherence. This was exemplified in the following excerpts:

Poor medication adherence is a major challenge among patients with hypertension and T2D comorbidities. We have some patients who are chronic defaulters. Some patients do not take medicine and prefer to come to the health facility when they are in a critical stage with serious complications. [...] Sometimes we run out of stock for essential drugs for hypertension and T2D since it takes longer for drugs to be restocked in the facility. This leaves us with no choice but to prescribe drugs for patients to buy from private pharmacies. (Primary care facility in charge).

The vast market for medical products and the relaxed legal status for the medicine trade were identified by the primary care facility in-charges interviewed as major facilitators for inappropriate polypharmacy and irrational use of medicines for the treatment of hypertension and T2D in patients with multimorbidities. According to one primary care facility in charge, the drug regulatory authorities are not very effective in enforcing the laws on the trade of medicine. The market is dominated by several drug shops managed by quacks who sell prescription drugs for hypertension and T2D over the counter thereby endangering the lives of the patients. This was noted by one of the patients interviewed who said,

There is a time I went to a chemist for refills and I was told by the pharmacist that despite the difference in the brands the drugs were the same. However, my condition deteriorated after using those drugs and I had to come with them here in the facility and the doctor ordered me not to take them again. (Patient FGD participant)

Meso level: professional integration

Professional integration refers to the extent to which healthcare professionals delivering care for hypertension and T2D coordinate services across various disciplines. In this study, interprofessional partnerships and shared competencies were classified under the overarching theme of professional integration. The facilitators of professional integration included task shifting and continuous medical education (CMEs) on new guidelines for integrated management of hypertension and T2D care. The integration of community resource persons such as community health volunteers (CHVs) enabled nurses and clinical officers to delegate healthcare responsibilities such as screening for blood pressure and anthropometrics to the CHVs. According to one County health manager, CHVs played an increasingly important role in the identification, linkage and retention of patients living with hypertension and T2D in care. One nurse stated that the facility-based CMEs enabled her to upgrade her professional skills and competence in the face of advances in medical science and the ever-changing clinical guidelines for the integrated management of hypertension and T2D.

The county health managers and the frontline healthcare workers interviewed identified several gaps in professional integration. These included a shortage of skilled personnel, inadequate budgetary allocations for in-service training, a high attrition rate, poor replacement mechanisms, a shortage of specialists and a rising number of unqualified healthcare providers. Inadequate curricula were cited by the County health managers interviewed as a major gap in the training of healthcare workers for integrated hypertension and T2D care. The training curricula for hypertension and T2D management were perceived by the doctors and nurses interviewed to be skewed towards therapeutic interventions with minimal focus on preventive measures. Voicing a general sentiment in response to a question regarding the healthcare workforce for hypertension and T2D management, one of the county directors of health interviewed stated,

There is an assumption that training of healthcare workers is a function of the national government and not county government and therefore the approved budget always has zero allocation for training and yet the capacity building has to continue. [...] Most of our curriculums in the colleges used for training our personnel are just focused on therapeutic interventions with little emphasis on how we can integrate prevention programs considering that prevention is more cost-effective than treatment, especially for diseases such as hypertension and T2D that require early detection. (County health director).

Meso level: organisational integration

Organisational integration refers to the extent to which healthcare facilities coordinate services for hypertension and T2D across different facilities. In this study referral

systems for hypertension and T2D emerged as a dominant theme under the overarching theme of organisational integration. Our findings show that public facilities had well-established referral systems. Voicing a general sentiment in response to a question regarding the referral systems for hypertension and T2D, one of the NCD policy experts stated,

The referrals for hypertension and T2D are structured across a four-tiered system comprising community health centers, primary care centers, county referral hospitals, and national hospitals and CHV led community-based demand creation activities such as screening for blood pressure and blood glucose, and identification of cases for referrals at higher levels of care. (NCD policy expert)

However, there were significant gaps in the referral systems as noted by one FGD patient:

Some of the doctors in the referral hospitals requests to have the test outside the facility yet they can offer those services and the reason is that they are collaborating with the owners of those facilities to make extra money from some of the services such as X-rays. (Patient FGD participant).

The macro level: system integration

Systems integration refers to the alignment of regulations and policies on care integration. Two themes emerged under system integration facilitators: decentralisation of services and multisectoral partnerships and interdependency.

Decentralisation of services

The decentralisation of healthcare services was cited by the County health managers interviewed as a major facilitator for the development of integrated care models for hypertension and T2D that suit the unique primary care needs of the county governments. The decentralisation also promotes the autonomy of decisions regarding resource mobilisation, allocation, expenditures and other administrative issues as was noted by a County health manager. The County governments are in charge of the management of secondary and primary care facilities including the county public sector health services such as ambulances and primary healthcare services while the national government is in charge of the national referral facilities and health policy.

Multisectoral partnerships and interdependency

Multisectoral partnerships and interdependency were reported as one of the drivers for the sustainability of integrated care for hypertension and T2D. The NCD policy-makers interviewed preferred a people-centred approach rather than an output-oriented one in delivering healthcare services for hypertension and T2D. According to one NCD policymaker, putting people-centred core health services in the spotlight was crucial in removing health

system bottlenecks that limit coverage of essential healthcare services for hypertension and T2D. Some of the key health stakeholders identified included county governments, the Ministry of health, NGOs, civil societies, the private sector and other government agencies such as the Ministry of education and public service. These stakeholders formed national and county-based technical working groups whose primary role is policy formulation, advocacy and coordination of management activities for hypertension and activities at the national and county levels.

The barriers to system integration identified from the interviews were disintegrated into three major domains including policy implementation gaps, devolution challenges, and inadequate monitoring and evaluation frameworks.

Policy implementation gaps

The NCD policy experts interviewed indicated that, despite the wide adoption of policies and guidelines on integrated management of hypertension and T2D, there was a widespread consensus that a majority of the policies had not been implemented as envisioned resulting in modest success. The implementation barriers are rooted in factors such as ineffective enforcement, inadequate allocation of human or financial resources, poor coordination and conflicting roles and responsibilities of the national and county governments. One of the NCD policy experts interviewed stated,

I can confidently say that Kenya has good policy experts who have developed a good policy framework for care integration of hypertension and T2D with good indicators, but what we are still grappling with is the implementation. (NCD policy expert).

Devolution challenges

The county health managers interviewed narrated that the health sector is bedevilled with conflictual relationships between the county and the national governments. The transition of the functions from the national to county governments has been marred by administrative issues and poor coordination of functions that presented resource allocation and utilisation challenges as captured in the following response:

The implementation of the devolution has been characterized by challenges on the transition of the functions of the national to the county government resulting in conflicts of interest, especially with regards to the budgetary allocations. (County health manager).

Inadequate monitoring and evaluation frameworks

Inadequate monitoring and evaluation frameworks for hypertension and T2D programmes were cited by the NCD experts interviewed as a major barrier to the integrated management of hypertension and T2D. According



to one NCD expert interviewed, the national HMIS, commonly known as District Health Information System, prioritises reporting on communicable diseases such as HIV/AIDS, tuberculosis and malaria, with a limited focus on hypertension and T2D. Furthermore, hypertension and T2D indicators covered in the annual work plans for the national and county governments are very few compared with the communicable diseases and reproductive health programmes. The paucity of data on hypertension and T2D results in difficulties to analyse the progress of implementation of integrated care programmes and the overall health systems performance.

Functional integration

Functional integration refers to the extent to which support functions such as financial, and information management systems are coordinated to promote integrated management of hypertension and T2D. In this study, the functional integration facilitators included the national health management information system (HMIS) and the National health insurance fund (NHIF).

National health management information system

The HMIS framework provides access to a free web-based open-source health management data platform. One of the County HMIS experts interviewed indicated that the availability of an HMIS was a major facilitating factor for the efficiency of integrated healthcare service delivery for hypertension and T2D. According to one HMIS expert, data reporting for hypertension and T2D is a requirement by the Ministry of Health in Kenya. Therefore, all public health facilities are mandated to submit healthcare utilisation data for hypertension and T2D on the District HMIS. This enables easy access to patient data and enhanced decision-making. The high mobile phone coverage in Kenya and internet connectivity especially in urban settings were also cited by the HMIS experts as major facilitators for the adoption of e-health technologies in hypertension and diabetes care.

National health insurance fund

The NHIF emerged as a major facilitator for healthcare financing. The patients interviewed explained how having an NHIF card was key in facilitating their access to health services for hypertension and T2D comorbidities:

In this facility, primary healthcare services are free as long as you have an NHIF card. I have benefited from free consultation, treatment, medication, and drugs under the Universal Health Coverage (UHC) initiative. (Patient FGD participant)

As highlighted in the quote, patients with health insurance coverage were able to access basic outpatient and inpatient services for hypertension and T2D, including consultation, tests and scans, treatment and medicine (except when the drugs prescribed are not listed in the coverage). This according to the patients would help them in making a timely decision to seek care, as money

is no longer a barrier. Other financial support that the patients reported included county-based public health insurance plans, donor funding support and free or subsidised services.

The functional integration barriers emerged along two broad domains including lack of interoperable e-health platforms for hypertension and T2D, health system-wide and individual financing barriers. The health system-wide financing barriers comprised inadequate budgetary allocations to the health sector in general and hypertension and T2D health services in particular, lack of NHIF accreditation of most primary care facilities. The individual financing barriers comprised; unaffordability of healthcare services, catastrophic out-of-pocket expenditures, lack of a health insurance plan and coverage limits for hypertension and T2D by insurance plans.

Lack of interoperable e-health platforms for hypertension and T2D

The lack of interoperable e-health platforms emerged from the HMIS experts interviewed as a major obstacle to the integrated management of hypertension and T2D. Patient data are dispersed over multiple systems making it impossible to make decisions for individuals or populations. Other barriers included poor internet connectivity, poor technology and lack of provider–patient interaction e-health platforms. One of the HMIS experts interviewed stated,

The lack of technological advancement to ensure interoperability is a major challenge for integrated management of hypertension and T2D. There is a lot of competition between different stakeholders in the profession of HMIS, but I think we should consider something universal so that when a patient goes to another facility, a unique code can be used to retrieve their information. (HMIS expert).

Inadequate budgetary allocation

According to one of the County health managers interviewed, the national and county budget investments on health in general and integrated management of hypertension and T2D in particular is woefully small with more allocations on recurrent expenditures such as wages and salaries. Furthermore, most donor funds target communicable diseases such as HIV, tuberculosis and malaria despite the growing burden of hypertension and T2D as exemplified in the following response:

We have very little budgetary allocation for preventive and promote healthcare services for hypertension and T2D since a lot of our budget goes to salaries and acute illness. For example in the last financial year, a third of our health budget was spent on salaries and wages. (County health manager).

Lack of accreditation by NHIF

The NHIF is a national priority under Sustainable Development Goal 3 to remove cost barriers to accessing

healthcare services for hypertension and T2D. However, the lack of NHIF accreditation of most primary facilities by the Ministry of Health was cited by the county health managers interviewed as a major healthcare financing obstacle. The NHIF subscribers living with hypertension and T2D mostly pay out of pocket for services accessed in some primary care facilities. One county health manager reported that only a few of the public primary healthcare facilities are accredited by NHIF. Most facilities rely on the collection of user fees and funding from the county government.

Unaffordability and perceived financial catastrophe

The cost of treatment for hypertension and T2D comorbidity was perceived by the patients to be very high causing most patients to both forego essential therapeutic interventions and also endure the physical, economic and psychosocial effects of high out-of-pocket expenditures. The user fees and copayments for health services for hypertension and T2D were perceived by the patients to be so high in relation to their incomes resulting in a financial catastrophe for the patients and their households. This situation forced them to cut down on necessities such as food and clothing. These sentiments were also confirmed by the facility in charge interviewed as explained in the following excerpts:

The diagnosis and treatment cost for T2D and hypertension is very high, especially for patients living with comorbidities. Some patients are forced to wait until they raise the money for essential lifesaving intervention which is time-consuming and may result in reduced prognosis and improve the disease severity. [...] Approximately over sixty percent of the income of patients with hypertension and T2D goes towards financing health since most of the drugs are not covered by the NHIF. (Primary care facility in charge)

Poor health insurance coverage

The NHIF does not offer comprehensive coverage for hypertension and T2D and most patients are often forced to pay out of pocket for healthcare services despite having health insurance coverage. One patient explained how she pays for drugs for hypertension:

I do not see any direct benefit even with my NHIF card. When I come to this facility, it cannot cover the cost me drugs for hypertension and diabetes and I have to pay out of pocket. (Patient FGD participant).

Such experiences frustrate patients to pay out of pocket for healthcare services at the point of care, which seemingly, impedes access to the needed healthcare services as further captured in an interview with a primary care facility in charge. This was also noted by one of the primary care facility in charge interviewed who reported that,

Over seventy percent of patients seeking care for hypertension and T2D in this facility pay out of pocket

for access to healthcare and this serves as a major barrier to access since most patients are often unable to afford the cost services such as medication and forego essential healthcare services (Primary care facility in charge)

Normative integration

Normative integration refers to the extent to which vision and work values that promote integrated management of hypertension and T2D are shared within the healthcare system. According to one of the NCD experts, the Kenyan government has prioritised Universal Health Coverage (UHC) as one of the agendas for socioeconomic transformation in line with Kenya's Vision 2030. The subsequent integration of chronic disease management activities in the UHC package was considered by the NCD expert interviewed as crucial in accelerating access to integrated care services for hypertension and T2D. However, the patients interviewed blamed corruption for the poor state of health service delivery for hypertension and T2D. Corruption is evidenced when some rogue doctors in public health facilities refer patients to their privately owned facilities for services available in the public facilities. One FGD patient narrated,

The problem we have in this facility is that the doctors who attend to us have their privately owned facilities where they spend more hours than in the public facilities. Therefore, they always refer us to their privately owned facilities where they overcharge the services for hypertension and T2D care. (Patient FGD participant)

DISCUSSIONS

In this study, we explored the perceived health system facilitators and barriers to the integrated management of hypertension and T2D in Kenya. Our findings follow the RMIC framework for monitoring and evaluation of integrated care. The results highlight the facilitators and barriers that are intrinsic to the RMIC domains including macro-environment, meso-environment and micro-environment. The major facilitators included patient-centred care models such as peer support groups, task shifting and integration of CHVs in primary care, and a national referral system. Others included a national HMIS, decentralisation of services, multisectoral partnerships and political will for UHC. The major health system barriers identified included vertical and unresponsive healthcare services, unavailability and unaffordability of medication, poor treatment adherence and irrational polypharmacy. Others included a shortage of skilled personnel, a lack of interoperable e-health platforms, care integration policy implementation gaps and inadequate monitoring and evaluation frameworks.

This study shows that patient-centred care models such as peer support groups are potentially important adjuncts



to clinical care for addressing patients' unique challenges. The WHO also proposes patients support groups, as an intervention to promote patients' coping behaviour and psychosocial functioning, medication adherence and retention in care.³⁰ The groups also, serve the purpose of sharing experiences, providing a safe learning environment which reduces stigma and discrimination and improves self-esteem.³¹ However, further studies and operational lessons are needed to maximise the benefits of the support groups among patients living with hypertension and T2D comorbidities.

Our results show that the healthcare services for hypertension and T2D were primarily offered as standalone services. This results in the fragmentation of services that threatens the holistic perspective of primary healthcare services. A possible explanation for this observation is the fact that the current chronic disease management guidelines were developed at a period when single chronic disease frameworks were common and have routinely focused on a single disease rather than a more holistic approach.⁴ The findings of this study are consistent with the results of the 2015 nationwide NCD survey in Kenya where only 15.6% of individuals with hypertension were aware of their elevated blood pressure and only 26.9% of hypertensive patients were on treatment with 48% of those on treatment having poor control.² Previous studies have also shown that essential primary care services for hypertension and T2D are not readily available in low-income and middle-income countries.³²⁻³³ This decreased healthcare access to primary care is partly attributable to the decline in the overall well-being of people living with hypertension and T2D comorbidity in SSA.³⁴

The NHIF emerged as a major facilitator for access to integrated healthcare services for hypertension and T2D. The lack of access to essential medicines has been identified by previous studies as one of the major health system challenges affecting the management of hypertension and T2D in SSA.³²⁻³³ The high costs of medications for hypertension and T2D are unaffordable to the majority of the patients who have to meet these expenses out of pocket payments. This situation is made worse by the long-term treatment and comorbidities that impose a lifetime financial burden on poor households, strained family support and leads to poor adherence to medication.³⁵ A study in Malawi estimated that a 1 month course of medication for a patient with HTN could cost as much as 18-days' daily wage.³³ In Kenya, public health facilities offer treatment for hypertension and T2D services only at the subcounty and county referral hospital levels and most patients have to pay user fees to access medicines. These high treatment costs inevitably constrain the success of long-term treatment. A great proportion of patients are lost to follow-up and many who attend their visits adhere less to treatment due to the high economic burden of purchasing drugs. Deficient procurement and distribution process of essential drugs for the treatment of diseases such as hypertension and T2D leads to frequent stock-outs of medications,

thus affecting the compliance of patients to medications and overall prognosis.

Our findings on limited skilled personnel at health-care facilities concur with the 2018 report on Human Resources for Health by the WHO that revealed an acute global shortage of health personnel in SSA.³⁶ The critical shortage of skilled healthcare workforce in SSA, including Kenya, is partly attributable to several factors such as low investment in training and recruitment, poor incentive structures, systems and mechanisms for healthcare workers and brain drain.³⁷ Efforts need to be made to ensure the availability, retention and capacity building of skilled healthcare personnel and specialist and efficient use of the existing health workforce such as task shifting.

Our results show that the national HMIS framework, high mobile phone penetration and HMIS pilot experiences facilitated the health information systems, while the barriers included lack of interoperable platforms, poor internet connectivity and lack of provider-patient interaction. Previous studies have also shown that in urban settings of African countries, there is the availability of basic information, communication and technology (ICT) infrastructure that supports electronic HMIS such as electricity, high penetration of mobile telecommunication and network, ICT human resources and higher population literacy rates.³⁸⁻⁴⁰ However, the availability of ICT infrastructure does not necessarily translate into enhanced integration of HMIS in primary care as the majority of the platforms are funded by international non-governmental organisations and lack ownership by the local governments.³⁹⁻⁴⁰ The lack of government ownership results in duplication and fragmentation of HMIS services for chronic illnesses as most platforms under implementation are not aligned with the national health information system hence resulting in interoperability challenges.

Similar to previous studies,⁴¹⁻⁴² the system integration facilitators for the management of hypertension and T2D in our study included multisectoral partnerships, interdependency and decentralisation of services. However, the barriers included policy implementation gaps, devolution challenges and inadequate monitoring and evaluation frameworks. As noted, by previous studies,⁴³⁻⁴⁴ the development and implementation of care integration policies are distinct, with the former considerably more challenging.

The findings of this study highlight important implications to health systems strengthening for the integrated management of hypertension and T2D in Kenya. A patient-centred approach at primary care level using interventions such as patient support groups or health education and promotion on shared risk factors for cardiovascular diseases could be useful in promoting integrated care. Furthermore, the health system needs to promote collaborative and coordinated care between and within care teams, health facilities and including community resources. Decentralisation of services and multisectoral partnerships will be important policy level enablers

of promoting integrated healthcare. Reinforcing leadership and strengthening the implementation of integrated management of hypertension and T2D through capacity building and budgetary allocations should be a key priority of the Kenyan government. To realise this, an actionable framework should be developed and integrated into the NCD and UHC action plans to enable the implementation and scaling of integrated care for common chronic diseases including hypertension and diabetes.

Strengths and limitations

This study triangulated perspectives from multiple stakeholders including healthcare providers, patients and policymakers to understand the barriers and facilitators to the integrated management of hypertension and T2D. This study has high credibility due to several reasons. First, the interview topic guides were developed with reference to the established WHO framework of health systems building blocks which ensured that questions on the integrated care for hypertension and T2D were adequately addressed to obtain accurate and relevant data. In addition, the involvement of trained experienced qualitative researchers, the use of rigorous methods of data collection and analysis and interpretation enhanced the credibility of the findings. The selection of a diverse range of participants from different counties sampled through a multistage approach provides rich information from diverse contexts that promotes an in-depth understanding of perceived facilitators and barriers to the integrated management of hypertension and T2D in Kenya.

The findings of this study should be read against the backdrop of two major limitations. First, due to the purposeful selection of the study participants, our results cannot be generalised to all patients with hypertension and T2D but may generate hypotheses for further research on integrated care in Kenya. Second, the results are based on self-reports and may therefore differ from actual health service delivery. These notwithstanding, we believe that the broad patterns of facilitators and barriers to care integration are likely to remain. Several practical lessons can be drawn from the findings of this study to inform policies that seek to improve the management of hypertension and T2D in Kenya.

Conclusions

Our results provide useful insight into the broader health system factors that enhance or impede the integrated management of hypertension and T2D in Kenya. The study identified the barriers and facilitators that may be harnessed to improve the integrated management of hypertension and T2D. The facilitators should be strengthened, and barriers to care integration redressed. A multipronged approach that includes health systems thinking and integrated care are imperative for bridging the gap for unmet need for hypertension and T2D prevention and treatment.

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Contributors PO conceptualised the study, reviewed literature and analysed the data. CA, EOAW, CW, EK, RO, JO and GA made substantive contributions to the conceptualisation of the study, and data analysis and reviewed the manuscript. All authors read and approved the final manuscript. PO takes full responsibility for the work and/or the conduct of the study as guarantor, had access to the data and controlled the decision to publish.

Funding The Joep Lange Institute and the Dutch Ministry of Foreign Affairs funded the original health service provision assessment in Kenya. The funders had no role in the design of the study and collection, analysis and interpretation of data and in writing the manuscript.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting or dissemination plans of this research.

Patient consent for publication Not required.

Ethics approval The original health service provision assessment in Kenya was approved by the Amref Health Africa Ethics and Scientific Review Committee based in Nairobi, Kenya (ref: DOR/2019/017). All participants were fully informed during the consent process that their participation was voluntary with the freedom to decline any question or withdraw from the study at any point in time and that no harm would occur to them or anyone in their family regardless of their participation decisions. Sensitive data collected during this study were deidentified. Efforts were made to guarantee anonymity by removing identifiable information. All data were confidentially stored and with password protection and access restricted only to invited necessary personnel for research-oriented needs.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request. The data sets used in this study are available upon a reasonable request to the African Population and Health Research Center (APHRC) through its Microdata portal (<https://microdataportal.aphrc.org/index.php/catalog/124>). No additional data are available.

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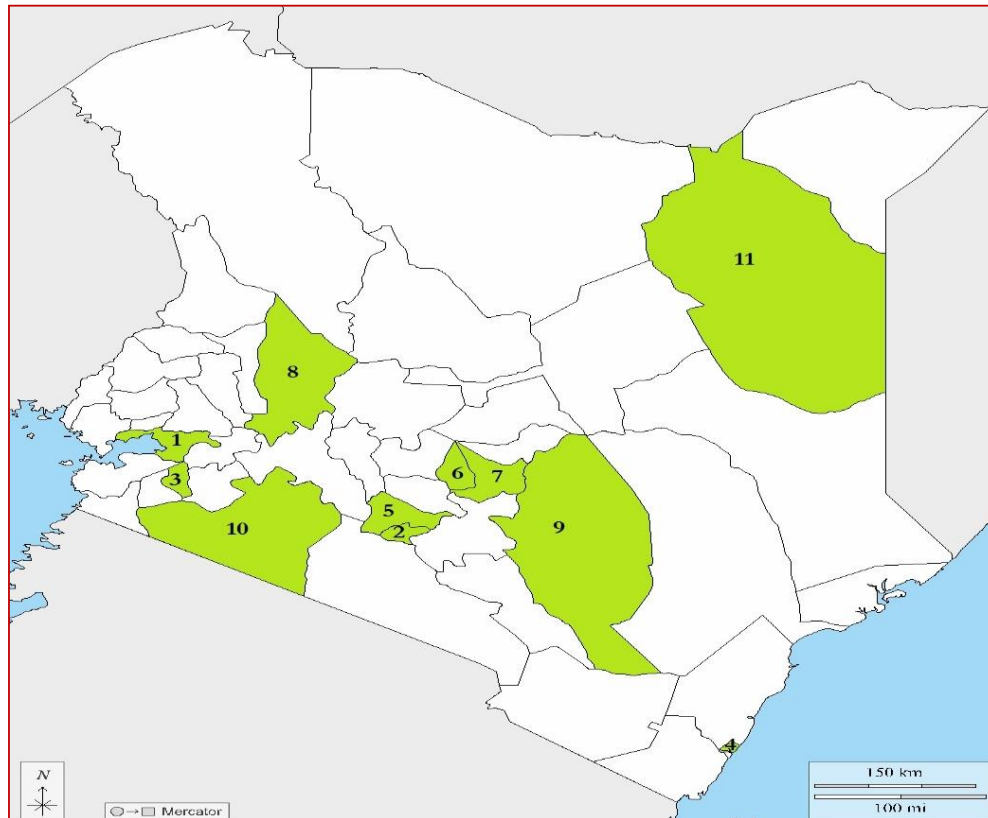
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Supplementary file 1: Map of Kenya counties included in the sample of health facilities assessed.



1 = Kisumu, 2 = Nairobi, 3 = Nyamira, 4 = Mombasa, 5 = Kiambu, 6 = Kirinyaga, 7 = Embu, 8 = Baringo, 9 = Kitui, 10 = Narok, 11 = Wajir. Blank map retrieved and adapted from: <https://d-maps.com/> [Accessed: 16 May 2022].

Supplementary file 2: Interview guide

Policymaker interview guide

Aim: To identify gaps, barriers, enabling and reinforcing factors in delivering integrated management and control of hypertension and type 2 diabetes at the primary healthcare level in low-resource limited settings.

The interview will last for about 60 minutes and recorded if consent is provided. Participation is completely voluntary and the interviewee has a right to withdraw participation during or after the interview.

Step 1: Read out relevant sections in Consent Form to interview participants

Step 2: Consenting participants to sign the Consent Form

Step 3: Casually chat with the participant to establish rapport

Step 4: Ask the questions below:

Part I: Background of the Interviewee

- What is your professional background?
- What are your current responsibilities?
- How many years have you been working in this field?

1. Policy

- Are there a national policy/ strategy/ action plan for integrated hypertension and type 2 diabetes?
- Are the roles and responsibilities of PHC highlighted in the policy? Specify if any.

2. Governance

- Which departments/ units/ groups are responsible for planning, implementing, supervising and managing related interventions for integrated care for hypertension and type 2 diabetes? What are their roles and responsibilities? Are there any collaborations between multiple departments?

Departments/units/groups include:

- Health sector (at national, county, sub-county and community levels)
- Other public sectors (finance, education, trade, etc...)?
- Private sectors
- Community organizations (women union, youth union, etc.)?

3. Health Financing

- Who are responsible for financing interventions for integrated care for hypertension and type 2 diabetes implemented at the PHC level (state budget, health insurance, foreign aids, out-of-pocket payment, others)? What is the trend of changes over time?
- Role of state budget: From central and local government? What cost items are covered by the state budget? How is the budget estimated? How is the budget allocated?
- Role of health Insurance: Provider payment mechanism?
- Role of foreign aids: Sustainability?
- Role of out-of-pocket payment: How user fee is set and collected? How the facilities utilize the fee collected? Regulation to control irrational care?
- Earmarking of taxes from fiscal interventions to influence behaviour change used to fund health promotion programs or a health promotion foundation?

4. Human resources

- What do you think of the current situation of integrated care for hypertension and type 2 diabetes and prevention in terms of human resources? Is there enough specialist working on this area? Is the training to health providers in terms of prevention and management?

5. Health information system

- Do you think the current health information system in the primary healthcare level is enough to prevent and manage hypertension and type 2 diabetes? What do you think is the priority in terms of improving the health information system at the primary healthcare level?
- What do you think about the feasibility of future implementation of M-health to help prevent and manage hypertension and type 2 diabetes? What are the possible barriers?

6. Service Delivery

- What services for hypertension and type 2 diabetes are available at the primary healthcare level (population-based health promotion program/ early detection of people at high risks/ early treatment of high-risk patients/ rehabilitative care)?
- Is there any issues related to access, utilization, quality, and equity?

7. Others

- What do you think about the current situation/ role/ future of primary healthcare in terms of providing integrated care for hypertension and type 2 diabetes to the general population?

Step 5: Thank the interviewee for their time.

Primary healthcare professional interview guide

Aim: To identify gaps, barriers, enabling and reinforcing factors in delivering integrated management of hypertension and type 2 diabetes chronic disease management at the primary healthcare level in low-resource settings.

The interview will last for about 40 minutes and recorded if consent is provided. Participation is completely voluntary and the interviewee has a right to withdraw participation during or after the interview.

Step 1: Read out relevant sections in Consent Form to interview participants

Step 2: Consenting participants to sign the Consent Form

Step 3: Casually chat with the participant to establish rapport

Step 4: Ask the questions below:

1. Integrated management of hypertension and type 2 diabetes

- 1.1 When managing patients with both hypertension and type 2 diabetes, has your facility ever met any problem or difficulty? If the situation is beyond the capacity of your facility, what will you do?
- 1.2 Does your facility provide regular follow-up service to patients with hypertension and type 2 diabetes?
If no – Why not? Do you think it is important to do so?
If yes – What kind? Have you ever met any problems or difficulties?
- 1.3 In what situation will your facility refer patients with hypertension and type 2 diabetes to another health facility?
Tell me more about this health facility (name, distance...). Have you ever met any problems or difficulties when referring a patient with both hypertension and type 2 diabetes?

2. Prevention of hypertension and type 2 diabetes

- 2.1 Does your facility participate in any kind of population-based health education/ promotion programs related to hypertension and type 2 diabetes? Who initiated these programs? Who paid for them?
Probe: Do you think they are useful? Why?
- 2.2 Does your facility provide screening programs to the community such as blood pressure testing, blood sugar and cholesterol level testing and lifestyle risk factors assessment?
If no – Why not? Do you think it is important to do so?
If yes – Have you ever met any problems or difficulties?
Probe: What will you do after identifying high-risk patients? Does your facility provide any management to those high-risk patients accordingly? Is there any guideline about high-risk patients' management? Have you ever met any problems or difficulties?

3. SIX BUILDING BLOCKS

- 3.1 Health service delivery

What services for hypertension and type 2 diabetes are available at your facility (population-based health promotion program/ early detection of people at high risk/ early treatment of high-risk patients/ rehabilitative care)? Who is responsible for delivering each service (the number and mix of staff, and how they work together)?

3.2 Health Workforce

Do you think you have enough workforce in your facility to manage patients with both hypertension and type 2 diabetes? What do you think about your workload every day?

3.3 Health information system

Are you satisfied with the medical recording system now? Especially when managing a patient with hypertension and type 2 diabetes.

If no – Why not? Any suggestions to improve?

If yes – What are the satisfactory factors?

What do you think about the feasibility of future implementation of M-health to help prevent and manage hypertension and type 2 diabetes? What are the possible barriers?

3.4 Access to essential medicines

Have you experienced a shortage of medicine in your facility? Do you think the medical equipment in your facility is enough to provide primary healthcare for hypertension and type 2 diabetes?

3.5 Health system financing

What is your opinion on financing related to the prevention and management of hypertension and type 2 diabetes? It could be government budget/ social health insurance/ commercial health insurance/ out-of-pocket payment.

3.6 Leadership and Governance

Are you aware of any policy related to integrated care for hypertension and type 2 diabetes from the government? What is your opinion?

Which department is in charge of the management and prevention of hypertension and type 2 diabetes in your facility? Do you think they are doing a good job? Do you have any suggestions?

4. Others

Do you have any other things to share with me?

Patient interview guide

Aim: To identify gaps, barriers, enabling and reinforcing factors in delivering integrated care for hypertension and type 2 diabetes at the primary healthcare level in low-resource settings.

The interview will last for about 40 minutes and recorded if consent is provided. Participation is completely voluntary and the interviewee has a right to withdraw participation during or after the interview.

Step 1: Read out relevant sections in Consent Form to interview participants

Step 2: Consenting participants to sign the Consent Form

Step 3: Casually chat with the participant to establish rapport

Step 4: Ask the questions below:

1. Integrated management of hypertension and type 2 diabetes

1.1 Please describe how your experience has been with the health care that you for hypertension and type 2 diabetes in this facility/organization (**probe on**).

- Availability of health providers
- Availability of drugs
- Waiting time
- Support groups

1.2 Please describe the barriers and challenges you have faced when accessing integrated health care for hypertension and type 2 diabetes in this facility

- i. How can these barriers and challenges be addressed?

2. Prevention of hypertension and type 2 diabetes

2.1 Please describe the things you do as an individual to manage/control your existing hypertension and type 2 diabetes and how visiting this facility contributed to or helped to make it possible to do the same. **(Probe on)**

- Hospital visits/Doctors' appointments
- Drugs/Therapy adherence
- Health provider relations with the patient
- Follow up by calls/SMS
- Participation in support groups

3. SIX BUILDING BLOCKS

3.1 Health service delivery

What are the services you receive for hypertension and type 2 diabetes when you visit the health facility/organization for care?**(probe on)**

- Triage
- Laboratory services
- Counseling (nutrition, physical activity, behaviour change)

3.2 Health Workforce

Do you think this facility has enough healthcare providers to manage patients with both hypertension and type 2 diabetes? If yes explain If no why?

3.3 Health information system

Are you satisfied with how your medical records are kept in the system now? Especially when being managed as a patient with hypertension and type 2 diabetes.

If no –Why not any suggestions to improve?

If yes – What are the satisfactory factors?

3.4 Access to essential medicines

Do you think this facility is well equipped to provide integrated care for hypertension and type 2 diabetes?

If yes explain/If No why

3.5 Health system financing

What is your opinion on financing related to hypertension and type 2 diabetes?

(Probe on)

- social health insurance
- commercial health insurance
- Out-of-pocket payment.

3.6 Leadership and Governance

Are you aware of any policy related to hypertension and type 2 diabetes from the government? What is your opinion?

What do you think about them? Do you have any suggestions?

Others

Do you have any other things to share with me?

Step 5: Thank the interviewee for their time.