

Facilitators and barriers for early detection and management of type II diabetes and hypertension, Sidama Regional State, Ethiopia: a qualitative study

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Abstract

Background: The burden of Non-communicable diseases (NCD) is rapidly increasing in Ethiopia and remains public health problem. The diseases have led to a double burden of diseases in the country.

Method: it was a qualitative study designed to explore facilitators and barriers for early detection and management of type II diabetes and hypertension, Sidama Regional State, Ethiopia. A total of four focused group discussions, twelve key informant interviews and twelve in-depth interviews were conducted; the data was collected using a semi-structured interview guide. The interviews were transcribed, coded, and analysed using a content analysis approach. The study was conducted in the selected governmental primary health care units (health centres and primary hospitals) from February to June 2021.

Results: The primary identified demand-side facilitators were; fear of early death, family history, exposure to mass media, knowledge of NCDs, and illness of unknown origin. As the same time the identified supply-side facilitators were. Concern of the federal government, the availability of the right policy, and the willingness of some health care providers. Also, financial problems, the unwelcoming approach of the health care providers, knowledge deficit, and lack of trust in public health facilities are recognized as demand-side barriers. In addition, lack of trained medical personnel, unavailability of screening and diagnostic materials, and dissatisfaction of the primary health care unit workers were identified as supply-side barriers to early detection and management of diabetes and hypertension.

Keywords: Type-II DM, hypertension, facilitators, barriers, adults, early diagnosis, Ethiopia

Introduction

Non-communicable diseases (NCD) are chronic diseases resulting from genetic, physiological, environmental, and behavioural factors (Russell et al. 2019; Damasceno 2016). Globally, NCDs have become the leading causes of morbidity and mortality and continue to be the major public health problems (Bigna and Noubiap 2019). According to the 2019 World Health Organization report on World Health Statistics, low- and middle-income countries are most negatively affected by NCDs (WHO 2019). NCDs are responsible for 41 million deaths worldwide each year, or 71% of all deaths. Approximately 15 million people between the ages of 30 and 69 annually die from NCDs; 85% of these "premature" deaths take place in low- and middle-income countries. Majority of deaths were caused by cardiovascular diseases (WHO 2022; American Diabetes Association 2018). By 2025 and 2035, respectively, the disease burden in Sub-Saharan Africa (SSA) was predicted to double for both hypertension (HTN) and diabetes mellitus (DM) (Kumah et al. 2021; Forouzanfar et al. 2017).

Ethiopia is projected to experience the most increase in DM prevalence between 2013 and 2035, with a predicted increase of 138.5 %, surpassing most other countries (Zeru et al. 2014).

Like other low and middle income countries (LMICs), Ethiopia suffers from a high incidence of non-communicable diseases. Studies have shown the reason that is globalization and lifestyle changes (Bollyky et al. 2017). In the country, recently communicable diseases have been slightly declining, and the incidence and deaths associated with NCDs are rising at an alarming rate (Shiferaw et al. 2018). Based on the studies, the prevalence of NCDs is estimated to account for 42%. Amongst these, 27% are early deaths happening to people less than 70 years of age. Disability Adjusted Life Years (DALYs) due to NCDs in the country has increased from 20% in 1990 to 69% in 2015 (Bigna and Noubiap 2019).

This means that the risk of dying from NCD is twice as high as maternal, neonatal, and nutritional problems together (Bollyky et al. 2017). NCDs contributed to 39.3% of the total deaths, 53% of age standard death rate (ASDR), and 34% of DALYs from all causes. Studies conducted in Ethiopia revealed that all the causes and types of NCDs observed have almost similar trends with the global trend of NCDs (Shiferaw et al. 2018; Bigna and Noubiap 2019). This rapid increase of NCDs in Ethiopia has brought a significant loss of economic burden to individuals, families, communities, and the country. The total burden of NCDs on the

Ethiopian economy is 31.3 billion birr (US\$ 1.1 billion), equivalent to 1.84% of the GDP in 2017 (Vladislav et al. 2019). In recent years, the government of Ethiopia has taken several initiatives to combat NCDs (Chang et al. 2019). The government has prepared a national NCD action plan, and Diseases Prevention and Control Directorate (DPCD) has been established. In order to provide NCD services, guidelines on clinical and programmatic management of major non-communicable diseases have been developed since 2016. The primary utilizers encompass nurses, health officers, and physicians in general practice (MD) working at the primary health care level, especially health centers and primary hospitals (Chang et al. 2019). In parallel, with the existing services in the primary health care unit (PHCU), they are expected to provide NCD and related services. The service is expected to be provided at the health posts by community health workers; health centers by health officers and nurses; and at primary hospitals by the organized multidisciplinary team members. However, at each level, unavailability or shortage of trained health care personnel, lack of basic logistics and supplies, lack of necessary materials and equipment are recognized as restricting factors.

Barriers usually could come from many reasons. Social and cultural norms, values, practices, and beliefs of the society are deep-rooted phenomena that significantly can affect the provision of any health-related services in the community by the health extension workers (Tiruneh et al. 2020). Researchers also confirmed that financial constraint was one barrier to visiting a health facility for a regular check-up (Russell 2019; Tiruneh et al. 2020). Some articles also mentioned that lack of health insurance, especially in LMICs, was a big deal mentioned by the health care providers of Dominica Republic (National Institutes of Health 2005). In Uganda, financial constraints and physical distance appeared to be significant barriers to accessing health care (Choi et al. 2019). It was also confirmed as a challenge that people do not want to visit hospitals; rather, they want to consult their neighbourhood's for their illness. They seriously rely on the consultations made by the lay than the health care providers. The other barrier mentioned is that the DM and HTN patients lack knowledge about the disease or treatment modalities (Martinez et al. 2020). This includes the food type that they can eat, the amount of salt and its source in a diet, the belief that medication can be taken if there is a symptom, and the belief that the medications have a negative consequence on their health (National Institutes of Health 2005; Rasul et al. 2022). In response to the problem, this study proposes investigating the factors contributing to poor uptake and low access to the available NCD services in the region mentioned above. It was planned to carry out an all-inclusive

participatory investigation into options for identifying the barriers and facilitators of optimally utilizing and decentralizing the NCD services.

Materials and Methods

Study setting: The study was conducted from February to June 2021 in PHCU, Sidama regional state, Ethiopia. The region is located 275 km Addis Ababa (the capital city of Ethiopia). The study area includes twelve PHCU (health centers and primary hospitals found in the selected woreda's of Sidama region, namely, Bansa, Arbegona, Dale, Derara, Boricha, Hulla, Shebedino, Wondogenet, Hawella, Hawassa Zuria, Aleta wondo and Hawassa city administration. From the four focus group discussions (FGDs), two were from urban and two from rural areas. The two rural FGDs were conducted at the health centers. All the PHCU provided a wide range of health services/ cares at preventive, outpatient, and inpatient departments (hospitals) and were purposively selected to represent diversity of patients and service providers.

Study design: The study used a qualitative approach guided by thematic approach to understand patients' and health care providers' perspectives on barriers and facilitators of early detection and management of type II diabetes and hypertension. Thematic approach as recommended by Nowell et al. (2017). By carefully reading transcripts in relation to the research question, the conceptual mapping of the themes that emerged from the data was accomplished.

Population and sampling: The patients came from various residential areas (including urban and rural) and PHCU. Health professionals from various professional categories were also included. Overall, participants and data sources were chosen in phases to accomplish the objective of saturating ideas about facilitators and barriers to early diagnosis and management of type II diabetes and HTN. Theoretical sampling (i.e. simultaneously collecting and coding the data to decide what data were to be collected next) (Qureshi 2018) were used. Throughout sampling, we excluded patients who were severely ill and unable to respond were excluded.

Data collection methods and procedures: The information was gathered by conducting (FGDs, in-depth interviews, and key informant interviews with patients, healthcare professionals, and directors of NCD clinics or directors of PHCU. The selected health facilities were contacted to obtain permission to conduct the study before the data-gathering process began.

However, communication with study participants only took place during the interview or conversation. Aside from the participants and data collectors, no other persons were present for any of the interviews or conversations held in hospital settings. A pre-

tested open-ended discussion/interview guide was employed to facilitate the discussion and interviews. In addition to taking notes during each discussion and interview, all FGDs (ranging from 60 to 90 minutes) and interviews (ranging from 30 to 60 minutes) were recorded using a digital voice recorder. Saturations of ideas have guided the determination of the size of the interviewee and FGDs. The data were collected on facilitators and barriers of early detection and management of type II diabetes and hypertension.

FGDs: A total of 4 FGDs were conducted. Two FGDs were conducted with patients and two with health care providers separately from residential areas. The FGDs were conducted with diverse groups of patients' health care providers. Each FGD was conducted by two qualified public health professionals fluent in the local languages (Sidamu affu and Amharic language) and had appropriate experience with qualitative methods. There were eight to twelve participants in each FGD. In order to ensure that the patients' ages and types of diseases were diverse, patients were chosen for FGD using a purposive sampling strategy. In order to capture a variety of perspectives and experiences, the participants included a balance of patients and healthcare professionals. The discussions took place in a private space that protected the participants' privacy and comfort. Few discussions, however, took place on the health center's premises under a tree. Consequently, diverse groups of health care providers including general practitioners (GP), nurses, pharmacists, and laboratory technologists, were included in the FGDs. To ensure the diversity of experience, health care providers were also purposively selected considering the durations of their experiences.

In-depth interviews (IDI) and key informant interviews (KII): A total of 12 patients and healthcare professionals from the PHCU who have been involved in the study were engaged in in-depth interviews. Six patients were sampled from urban and six from rural health care units. Patients were chosen randomly to guarantee a variation in age (from 30 to 75 years) and sex (four females and eight males). Two public health professionals who were fluent in both Amharic and Sidamu affu conducted the interviews and verbatim translated them into English. The interviews were held in a private location to safeguard the patient's privacy and comfort. A total of 12 key informants, including at least one from each PHCU, were purposefully interviewed to triangulate with the results of patient interviews and FGDs. Most of these key informants were heads of NCD clinics and health centers. A trained data collector also carried out the KIIs. The interviewers and discussion leaders were hired solely to conduct and record the conversations and

interviews; they had no further involvement with the study.

Data analysis: The audio files of the collected data were transcribed verbatim and then translated into English for precise analysis by the principal investigator. To come to an agreement on the coding scheme and the consistent code definitions utilized to all transcripts, the research team analyzed the coded transcripts and generated codes. Study participants used an inductive approach to coding, comparing, and contrasting the meaning of the expression patterns. As O'Brien et al. (2017) recommended, thematic approaches carried out the transcripts coding and identifying emerging themes. Two main themes were identified. 1) *Demand-side facilitators and barriers to early detection of NCD* 2) *Supply-side facilitators and barriers to early detection of NCD*. Anonymity was applied to maintain confidentiality throughout the transcription and interpretations of the findings.

Quality control: Data were gathered by highly skilled public health professionals, ensuring the trustworthiness of the results. The appropriateness and relevance of the guides were ensured through expert reviews and pre-testing of tools. The field team held a debriefing session each day during the entire fieldwork to guide the selection of different samples toward the richness of the data. Facilitators' and note-takers impressions were documented for each data source. Data from FGDs and KIIs were triangulated to ensure credibility. Representations of primary and general hospitals and health centers from across different settings were made to enhance the transferability of the findings.

Results

For simplicity, the result was divided into two main themes 1) demand-side facilitators and barriers and 2) supply-side facilitators and barriers. Moreover, each theme was separated into two sub-themes, and finally, categories for each sub-theme were provided. DM and HTN patients were included in the FGD and IDIs, but in the KII, either managers or NCD focal persons working in the public PHCU more involved. Detailed characteristics of the study participants are presented in Table 1.

Demographic data: The study participant's characteristics and demographic data is displayed in table1. As described in table 2, the result has two main themes, two subthemes, and twelve categories drawn from the result of the study.

Factors affecting early detection of Type II DM and HTN: The basic results obtained from the research were schematized. The themes identified were; the demand-side facilitators, demand-side barriers, supply-side facilitators, and supply-side barriers (Figure 1).

Table1: Participant's characteristics and demographic data

Characteristics	FGDs (N=42)	IDIs (N=12)	KII (N=12)
Working setting			
Rural health facilities			4
Urban health facilities			4
Primary hospitals			4
Residential areas			
Rural resident	20	6	
Urban resident	22	6	
Age category			
20-29			2
30-39	12		5
40-49	14	4	5
>=50	16	8	
Gender			
Female	19	4	4
Male	23	8	8
Duration of stay in the PHU			
<10 years			2
10-19 years			7
20-29 years			5

Table 2: Themes of the research

Major theme	Sub themes	Categories
Factors facilitating for early detection	Supply and demand side pulling factors	Fear of early death Family history Mass media/social Media Knowledge on NCD (patient) Illness of unknown origin Concern given by the MoH
Factors affecting early detection of NCD	Supply and demand side pushing factors	Lack of guidelines and refresher training Unavailability of screening and diagnostic materials Financial problem Unwelcoming approach of the HCP Knowledge deficit (HCP) Lack of trust on the public PHCU

Under this theme, demand-side facilitators were identified as *fear of death, family history of DM, exposure to mass media, and knowledge of NCDs* are explained below.

Fear of death: Most of the study participants reported that the reason for demanding medical care is that they know a person who died of DM or HTN.

"I lost my husband two years ago because of DM and HTN. At the time, he knew about his illness after getting all the complications. One day when he woke up, he could not walk and talk properly. Then our elder son took him to a nearby health facility. They informed us it is because of HTN. After that day, he started medications, but his condition worsened, and he left the family alone." (A 62 years old female, urban resident)

In addition, participants from the FGD explained the growing number of early deaths in their city as follows;

"People used to die when they get older, but in recent years people are dying at an early age; if you ask us why the majority were dying because of NCDs."

In addition to the problem mentioned above, a participant who lost her husband by DM and HTN said,

"My husband died of this problem, and we have four kids, and their age is below ten years. So, if I am sick and die, my kids will go to the street because no one can take care of them. So, I wish to live longer until my kids become mature." (A 57 years old female, urban resident).

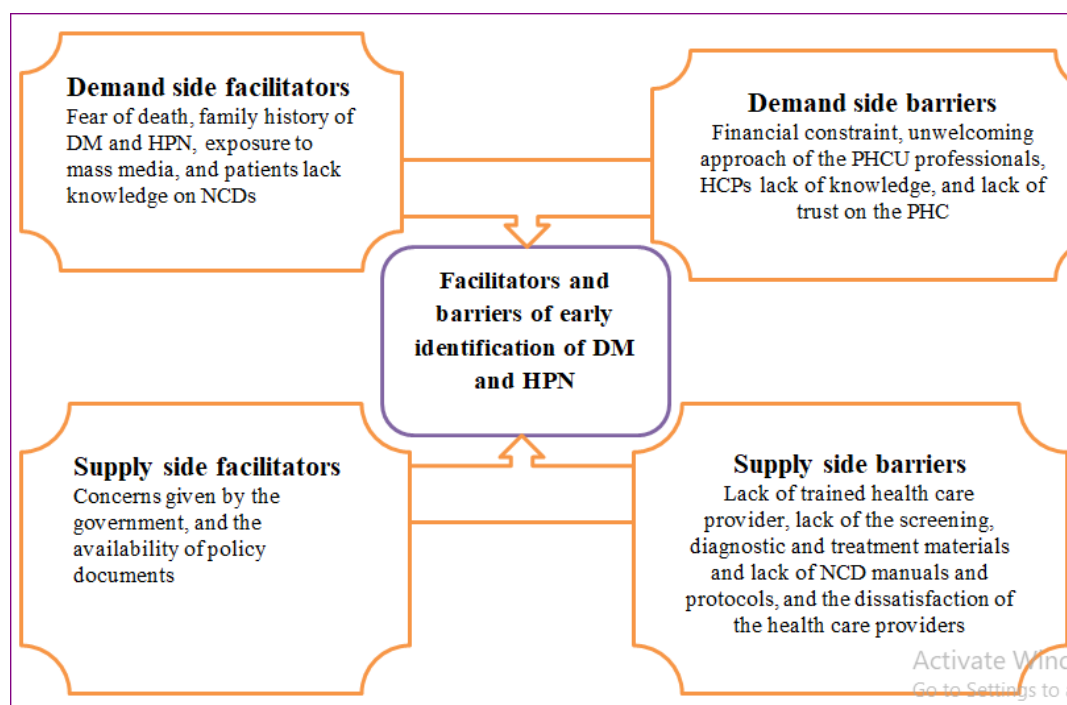


Figure 1: Supply and demand side facilitators and barriers of early detection of Type II DM and HTN

Family history: The majority of the study participants demanded health care because of their family history of DM or HTN. One of the interviewees told us that:

“My father has DM, and he told all his children to have a medical check-up. I went to a private medical center to have a general medical check-up one day. I underwent an internal medicine check-up, and the doctor told me that I had DM; I argued with him not to start a medical treatment and went back home. After three months, I fainted and fall down over a street.” (A 44 years old male, urban resident).

Another man whose age was 71 told us the following.

“I have both DM and HTN. I did not get these diseases from my parents, but two of my children developed DM. So now a day’s majority of the urban residents know that DM and HTN can pass genetically.” (A 71 years old male, urban resident).

Mass media: Exposure to mass media was the other facilitating factor for demand creation among the participants. The majority of the FGD participants underlined that messages transmitted via the mass media (radio and television) significantly contribute to creating knowledge and awareness of DM and HTN.

A 54 years old participant raised that:

“I was screened for DM because of mass media. One day, I watched a TV channel

called Ethiopian Broadcasting Service (EBS), and it was broadcasting physical exercise. In the session, there was a health care provider who was explaining the benefits of exercise. Finally, he explained about the body mass index (BMI) and waist circumference. Immediately, I calculated my BMI and tried to measure my waist, which was above the cut-off point. The next day, I discussed with my wife, and we both decided to visit a medical doctor... I was diagnosed with DM.” (A 54 years male, urban resident).

In addition to that, patients with DM and high blood pressure told us that they would follow the Sidama language radio program and benefit significantly from hearing the health program twice a week. According to the program, high salt intake can lead to high blood pressure, and they understand that reducing salt intake is essential for health. The audience was able to raise the awareness of the community by spreading the message.

Knowledge on NCD: The other important thing which the participant raised was knowledge on DM and HTN. Almost all FGDs agreed that knowledge has an excellent ability to demand health care. Some of the raised ideas are discussed below:

“My son is a health care provider, and he told all the family members to get a medical check-up. The reason to push us forward was the knowledge that he has.” (A 40 years old male, urban resident).

Other FGD discussants from the urban community rose that the illiterates have lesser knowledge than

the literate in taking care of themselves and their family members, and was expressed as:

“My father was a known diabetic patient for the last 15 years, but at the first time, it was a severe issue to tell him the dos and don’ts. The physicians told him not to eat foods that are not allowed for DM patients, but he eats them and becomes ill because of the knowledge gap.” (A 57 years old male, rural resident).

One of the urban FGD participants raised the benefit of knowledge as follows.

“My thought about DM was feeble until the day that my leg got amputated. I have a small wound between the toes in my leg. I treated it by using cultural and homemade remedies, but it became worse than the previous. The wound was small in size and later became very large, and with pus. After two months, I went to the hospital, and the doctor told me that it had changed to gangrene and that amputation below the middle-lower long bone should be done. I refused and went back home; after a month, my children and my wife forcefully took me to another hospital. The physicians decided that the amputation was mandatory, but the place was just above the knee It is because of the knowledge deficit, but today I am the one who is telling all the reality about DM for my community.” (A 69 years old male, rural resident).

Demand side barriers: The demand side barriers were also the main categories that the FGD discussants and the IDIs focused on. Here are some of the themes that emerged from the discussions and interviews. These were a *financial constraints, the unwelcoming approach of the public health institution, lack of knowledge of the PHCU, and lack of trust in the PHC* were discussed.

Financial constraint: Financial constraint was mentioned as the major barrier to the early identification of DM and HTN. Study participants mentioned that there are no diagnostic materials and medications in public health institutions, especially in rural areas, that urge patients to visit private health facilities. However, the price of the sector is not affordable at private clinics. One of the IDIs shared his experience as follows:

“....You do not know when and how your blood glucose raises. May be if you get into a stressful situation, it will increase. For example, today, I brought 400 birr for my follow-up and purchase of medications. However, they urged me to pay 60 birr for card, so I would not have enough money to buy the medications. Also, I will not have money for a taxi because I am a pensioner and I have a family to feed. I saved the money by giving due attention to my health, but still, I can’t

fully pay for my health issues.” (A 64 years old female, urban resident).

IDIs from rural residents mentioned the following *“In the rural setting, we do not have access to health care; we only go to health facilities either for contraceptive or for vaccination. Otherwise, it is impossible to visit health care regularly for a check-up. The reason for this is because we women especially do not have money. So, it is not common to check your status before you get critically sick.”* (A 52 years female, rural resident).

Unwelcoming approach of the public health institutes: Almost all the study participants of IDI and FGDs reached consensus about the unwelcoming approach of the health care provider. One of the IDIs mentioned its significance as follows.

“I met a doctor at one of the government hospitals found in the city; he was very irritable and did not want to respond to my questions properly. The same day in the afternoon, I went to one of the private clinics in the city and met him there. However, his approach was very different from the government hospital. He was encouraging me with beautiful words, treated me in a way that it is expected. After that day, I decided not to attend the government hospitals.” (67, Male, Urban).

The FGDs also strengthened the ideas raised by the IDIs as follows

“Nurses who work in government health centers did not qualify the basic knowledge which can help them diagnose and treat patients of DM and HTN. To cover their weakness, they always show their disgusting face. On the other side, those nurses working in private health facilities have a welcoming and inviting face. If it is in a private health facility, the patient and patient attendants have the right to claim their right. But it doesn’t work in public health facilities.” (A 72 years old male, urban resident)

One of the IDIs seriously described the quality of the service provision at the public health facilities as below:

“The service provided in a public health facility is very poor. I can say it is ZERO because I was coming every month to have my medications; however, without any sound reason, I will stay for more than six hours. The physicians will come after two hours of my arrival. Thus, if I have some money to pay for the private health facilities, I don’t want to come here; rather, I prefer to visit private clinics. The strange thing that I observed is that the doctors working at the private clinics

in the city are from the public health facilities, but they completely became good when I met them at a private clinic.” (39 years old male, urban resident)

Knowledge deficit (lack of knowledge):

Knowledge of the health care providers towards DM and HTN is considered one of the significant enabling factors for the early detection of DM and HTN. KIIs from rural health centers raised their significance as follow:

“Majority of the health care providers who are assigned to rural settings do not know about NCDs. The reason is that they graduated from the private health science schools; they paid for the certificate but not for the knowledge. The private health science schools are selling the certificate, and then they will kill the people in the community.” (A 29 years old male, rural resident)

The other two KII from remote health facilities explained the problem as:

“I am the head of the health center. I am here only to maintain maternal and child health and treat communicable diseases. We have a regular monthly meeting with the Woreda health office; however, NCDs are not our priorities. We are more than twenty, but no one took any training on NCDs, but recently a non-governmental organization came to us, and now we are trying to screen hypertension with the help of this NGO.” (A 32 years male, rural resident)

One KII from the rural primary hospitals explained about the qualification of the health care providers at the rural:

“In the majority of the remote health centers, the qualification of the health care providers is only diploma; the reason behind this is that no one wants to work in a very rural area. The office may assign, but they still go after having their salary.” (18 years of service in the rural health facility)

IDIs and KIIs were mentioned as illness of unknown origin that make people to visit a medical care. One of the IDIs said that:

“I have suffered a lot for a year; every week I visited a public health center because of the unknown origin of my illness. The medical personnel working in the health center diagnosed me with typhoid and typhus and prescribed medication. I took all the medicine but no cure. Finally, I went to a private health facility in Hawassa; they identified the problem as DM.” (A 56 years old female, rural resident)

Lack of trust on the public health institutions:

Public health institutions are expected to deliver an all-inclusive service for all the community by using the minimum standards. However, FGDs were raised some arguments on the institutions as follows:

“All the day, the health care providers provide the same kind of medications, whatever your illness is. For instance, they always gave me' ciprofloxacin' I took in my first years of illness, but there was no cure. This is not only for me, but it is the same for others too.” (A 56 years male, urban resident)

The IDIs from the rural residents explained that

“I was frequently visiting government health centers; however, they did not know about my illness. The only diagnosis they knew is typhoid and typhus.” (A 41 years female, urban resident)

FGDs from the urban mentioned different kinds of information which has a very touching content as follows:

“The flow of patients to the public health facilities is enormous, but the quality of the service provided at the public health institution is very deprived. If I was asked to mention some examples, someone in my neighborhood was sick. I took her to the nearby health center to visit a professional, then gave her a medical prescription; we went to purchase medication and went back home. After she took the first dose of the medication, a messenger came to change the medication, but she had already swallowed the first dose. Thus, it is impossible to trust public health professionals.” (A 62 years female, rural resident)

Supply side facilitators: Medical supplies and logistics are essential for the early detection of NCD. These supplies are recognized as medicines, screening, and diagnostic materials. As regards the supply side facilitators, the below themes were drawn. These themes are the concerns given by the government and the availability of policy documents. KIIs from both urban and rural health facilities raised the following:

Concern of the government: In collaboration with international non-governmental organizations, the Ethiopian ministry of health prepared a guideline on the prevention and clinical management of NCDs (Kamvura et al. 2022). This is also acknowledged by the KIIs as follows.

“In reality, the government is trying to focus on the prevention of NCD. These trials can be seen as one of the majors taken by the government. For instance, there is a structure called “disease prevention and control directorate” at all structures, from the federal

to the Woreda. One of the duties of this directorate, especially at the federal, regional and zonal levels, is to coordinate the activities of NCDs. Therefore, these can be shown as the concern given by the government.” (5 years of experience male, urban PHCU worker)

The second KII also mentioned that:

“Even though the concern is not as good as the communicable disease, we couldn’t find the printed and published materials. I heard that the government had prepared a clinical management manual for NCDs. So this should be appreciated. And hope things will be good soon.” (3 years’ experience female, rural PHCU worker)

The supply side barriers: As discussed in the facilitators, barriers to not screening the NCDs early are a problem. The main barriers, as FGDs of the health care providers mentioned, are lack of trained health care providers, lack of screening, diagnostic and treatment As discussed in the facilitators, barriers to not screening the NCDs early are a problem. The main barriers as FGDs of the health care providers mentioned are lack of trained health care providers and lack of screening.

Lack of screening, diagnostic and treatment materials: One health officer assigned in the rural health facility gives his concern on the unavailability of materials as follows:

“In the rural health centers, we are suffering from the lack of diagnostic materials like glucometer with its strip, and BP apparatus. The only option for the rural community is the public health facilities, but the facilities have no basic materials to help the community. Even sometimes, I feel terrible because the people of the community come to us to get help, but we are not capable of helping them.” (3 Years of experience male, rural PHCU worker)

The other KII from the rural primary hospital explained that:

“For two years after the establishment of the hospital, we had a new BP machine, glucometer with its strip, weight and height scales and medications for the treatment of DM and HTN. Those consumables served for the first six months, but the hospital was expected to fill by its budget, which is impossible to do so. After a while, our patients and we started to suffer from this lack. The majority of the medical equipment has become non-functional, and we are expected to buy from the government drug retail but points as they cannot provide what we need. With all these constraints, we are trying our best.” (2 years of experience, male, rural PHCU worker)

One of the health centres’ head expressed his feeling as follow:

“We are expected to plan and buy medical commodities by ourselves from the government drug and medical equipment distributor. Because, it is not permitted to fulfil shortage of supplies from the private sector even patients have the money for that; it is not allowed to buy from private retailers. If this is not solved correctly, the existence of the problem will continue.” (5 years of experience male rural resident)

Lack of guidelines and refresher training: Screening and treatment guidelines and refresher training are fundamental for the early detection of disease. However, NCD prevention and treatment guidelines are not found in rural health facilities and even urban facilities. The problem is serious in a rural setting, and the reason for this is cited as follows:

“In rural health facilities, you do not have electric power, no water, no broadband internet connections. These make it very difficult to browse and get guidelines and protocols at the rural.” (2 years, Female, Rural)

The other issue that the KIIs raised was that the majority of the health care workers were not satisfied by the government. They reported that, they were not paid their salary monthly. They did not have any up-keeps, benefits packages, refresher training, experience sharing, and others; because of these, they were dissatisfied with their work.

Discussion

This study highlights the facilitators and barriers faced by both the patient and the primary health care unit workers in providing and receiving adequate diabetes, and hypertension care. To the best of our knowledge, this is the first study of its kind exploring facilitators and barriers within Ethiopian DM and HTN patients and primary healthcare context. Similar findings have been highlighted in the region.

This study revealed vital problems related to supply and demand-side facilitators and barriers for the early detection and management of DM and HTN in rural and urban public health facilities in the Sidama region, Ethiopia. Two major themes have emerged, I) supply-side facilitators and barriers II) demand-side facilitators and barriers. Under each central theme, four sub-themes were drawn viz i) supply-side facilitators, ii) supply-side barriers, iii) demand-side facilitators, and iv) demand-side barriers. Each is discussed as follows:

Our study identified family history of diabetes and hypertension as the main facilitating factor which urges people to be screened for diabetes and hypertension. Literature sources support that family history is a risk factor for developing hypertension and diabetes (National Institutes of Health 2005;

Choi et al. 2019). Besides, the likelihood of getting high blood pressure and diabetes before the age of 50 increases two times the chance of having one or more close family members with these conditions (Ranasinghe et al. 2015).

Another best facilitator for the early diagnosis and management of diabetes and hypertension was found to be fear of early death. Premature death is often correlated with undiagnosed NCDs (Martinez et al. 2020). This study is consistent with studies conducted in Pakistan which identified fear of premature death identified as the facilitating factor to early screening and diagnosis (Gowani et al. 2016; Martinez et al. 2020)

The other facilitator for the early diagnosis and management identified by our study was the benefit of mass media. The purpose of mass media in the fight against NCDs is to spread information, alter attitudes and beliefs, and/or develop skills that will enable people to lead healthier lives. Mass media campaigns have been used worldwide to focus on various public health issues, such as alcohol and tobacco usage, cancer prevention, sexual health, and road safety. Fewer mass media outlets have recently covered nutrition, physical exercise, and overweight and obesity. During the session's mass media was considered very important to create awareness and knowledge for the community. Studies conducted in Jamaica, Sydney and Bangladesh supports our study (Brown et al. 2012; Kite 2018; Purtle and Roman 2015). These studies demonstrate the power of mass media to successfully alter behavioural risk factors linked to NCDs in developing nations, and they highlight the need to include technologies into NCD prevention and management programs (Bellew et al. 2017; Rimal and Lapinski 2009)

The second theme of this study is the demand side barriers of early detection of DM and HTN, which are: The unwelcoming approach of the HCP, knowledge deficit from the health care providers, financial constraints and lack of trust in the public health care providers.

This study revealed financial limitations proved to be an important barrier to gaining access to lifelong chronic illness medications. Hence, previous studies recognized that finance is a base to screen, diagnose and treat all types of disease including NCDs. A study conducted in South India found that 69.6% of families paid out-of-pocket costs for outpatient care for chronic diseases (Bhojani et al. 2013). Other studies indicated that, medication costs have accounted for the majority of out-of-pocket healthcare expenses in general and chronic illness costs in particular (Ghosh 2011; Garg and Karan 2009). Scholars from Zimbabwe (Kamvura et al. 2022), Ethiopia (Getachew et al. 2020), Uganda (Ojo et al. 2017), Latin America (Blasco-Blasco et al. 2020), (Shrivastava et al. 2013)

and India (Bhojani et al. 2013) identified financial constraint was barrier to early diagnosis and management of DM and HTN.

The significant challenges faced by the patients when they went to public PHCU were; the unwelcoming approach of the HCP and lack of trust in the HCP as the major problem for the early detection of the NCD. Similar to this study, prior studies identified inadequate communication between health care providers and patients have been associated with patient dissatisfaction and mistrust of their providers (Wakefield et al. 2010; Bhojani et al. 2013), which in turn have been major contributors to patients not to visit the health care (Heller et al. 2019). Since communication is a key to our daily life, patients need to be appropriately communicated. So that, the unwelcoming approach of the health care providers can be seen as a barrier for the community, not only for DM and HTN patients but also can negatively affect the whole health care system. This result is consistent with studies conducted in Saudi Arabia Ethiopia, Bangladesh, and Pakistan (Heller et al. 2019; UNDP 2017; Banatvala and Small 2020; Ranasinghe et al. 2015; Maurel et al. 2008; Ojo et al. 2017).

Supply-side facilitators for early DM and HTN detection and management were drawn from the KIIs (NCD focal person at primary hospitals and head of the health centers). As per the result from the head of PHCU or the NCD focal person, *focus given by the government for the chronic diseases, availability of policy documents, and willingness of some PHC workers to provide the HTN and DM services are mentioned as primary driving factors for early detection of NCDs at the PHCU of Ethiopia.*

This result is consistent with the initiatives taken by other African countries (Gowani et al. 2016; Choi et al. 2019; Getachew et al. 2020). Evidence shows that engaging primary health care units in screening, management, and control of NCDs are confirmed to be effective (Kite 2018; Ojo et al. 2017; Blasco-Blasco et al. 2020).

To scale up all-inclusive health care, including NCDs, health care providers working in the PHCU should effectively be engaged in the prevention and management of NCDs. The government should avail all supplies essential for the early detection of NCDs (Shrivastava et al. 2013; Kok et al. 2015). While the on-going problem of COVID19 is increasing, the role of PHCU is crucial in the prevention and management of pandemics (Kok et al. 2015). Pieces of evidence showed that people with NCDs have a higher risk of acquiring COVID 19 than others (Kok et al. 2015).

In this study, professionals working in PHCU (primary hospitals) were significantly interested in providing NCD-related services for their

community. Even though their number is minimal, the motivation of the health care providers in the primary hospitals can be taken as an essential factor for the management of DM and HTN and achieving the Sustainable Development Goal-3 (SDG-3) and Health Sector Transformation Plan (HSTP) “good health and wellbeing” in Ethiopia by 2030 (Moges et al. 2020; Nundy and Han 2012).

Ethiopia's primary health care units are not yet well prepared to mitigate the increasing burden of NCDs. As a result, the people are suffering from the medical complications of NCDs, faced financial constraints at a household level, loss of productive age groups, which brought economic loss for the country in general (Kankeu et al. 2013). This result is consistent with other researches done in Bangladesh (Ndukauba and Ngozihooba 2021) in Demonic Republic (National Institutes of Health 2005) and Ethiopia (Ranasinghe et al. 2015).

Studies in Ethiopia have reported that despite the introduction of NCDs management at the PHCU in the country, NCD-related services' implementation challenges the growing burden of NCD services (Ranasinghe et al. 2015; Shiferaw et al. 2018). However, creating a working team and delivering the service in LMIC like Ethiopia is possible and has been highlighted by many studies. However, the issue is to change the already available resource into an action (Shiroya et al. 2022; Jimenez Carrillo et al. 2020).

In our study, participants mentioned financial constraint as the major demand side barrier for early detection of NCDs. As presented by DM and HTN patients, the issue of finance is not only for their treatment, but due to its chronicity they can't afford even to their daily lives. And it is supported by other researches in Uganda (Choi et al. 2019; UNDP 2017).

The other very important result revealed from the study was health care providers' lack of knowledge on NCDs. This revealed that CHWs had limited NCD prevention and control knowledge. Numerous studies in various sub-Saharan African countries, such as the Democratic Republic of the Congo, Uganda, Tanzania, South Africa, and Nigeria, have also shown comparable findings of poor knowledge of prevention and treatment of specific NCDs, including diabetes and hypertension, among HCWs in low-level healthcare settings (Akinwumi et al. 2021; Mendis et al. 2004; Kapongo et al. 2015; Peck et al., 2014; Shiferaw et al. 2020).

The poor knowledge of PHC workers in the study area could be that most of them have never received or participated in any refresher training program after many years of practice. This could have also led to a lack of knowledge updates, which put many PHCU in the dark on how they can effectively manage NCDs. Notably; the lack of required

refresher training may compromise the efficacy of individual CHWs and add to unpredictable effects.

Patients' perception towards DM and HTN screening was higher in the urban residents than the rural. The reason could be that urban residents have exposure to media (social and broadcast) but that the rural residents might not have. This finding is also consistent with research conducted in the northern part of Ethiopia (Vladislav et al. 2019). There is also a difference between urban and rural patients' levels of understanding of the chronicity of the disease. The rural residents do not know the risk reduction strategies like minimizing a daily salt intake for hypertensive patients. The rural PHCU (health centers) do not provide sufficient information for all patients regarding NCDs. However, their main concern was communicable diseases.

To provide screening and early detection and mitigate the continuing increase of NCDs in Ethiopia, primary health care providers are based at the primary health care units. To achieve universal health coverage and meet the country's SDGs by 2030 is vital to implement the guiding policy of NCD.

The very important result explored from this study is that the early identification of DM and HTN were affected by both the health care provider and the patients. It is stated that rural health experts do not have enough knowledge and training to predict diabetes and high blood pressure. The reason given for the lack of knowledge of the health care professionals is that most of them are trained in private training institutes, so, they lack the necessary knowledge.

The other identified barrier for the provision of NCD early detection and management is dissatisfaction (no incentives) of the health care provider. According to Heller et al.'s (2019) systematic review, the barriers that inhibit health workers in providing care for NCDs are; an excessive workload, poor staff retention, low patient health literacy, lack of data collecting methods, shortage of medications and supplies, lack of financial incentives, and underfunded health care structures (Blasco-Blasco et al. 2020).

Conclusion

By using the qualitative methodology, facilitators and barriers for the early detection of NCDs were identified. Lack of trained healthcare providers, unavailability of screening and diagnostic materials, and dissatisfaction with PHCP were identified as the major supply-side barriers. Fear of early death family history, mass media/social media, concern given by the MoH, illness of unknown origin, and knowledge on NCD were recognized as the major demand-side facilitators. Whereas financial problems, the unwelcoming approach of the HCP, knowledge gap, and lack of trust in the HCP were

known to be major demand-side barriers for early detection of NCDs. Finally, due attention should be given to the early detection of DM and HTN by mitigating the barriers. As the problem of NCD is becoming challenging, especially in Ethiopia, policies should be revised at the federal level, zonal, and woreda levels. There is also a need to have trained health workforce.

Recommendations

Ethiopia is expected to restructure the current health care delivery system all over the country to address the current health care problem through innovative and supportive supervision. The country should also focus on NCDs as attention is given to CDs. Building the capacity of the health care providers through training is also very pivotal for screening and management, and referral and follow-up. To tackle the existing problems like training of health care providers, availing basic screening and management materials, and others, the government may need to collaborate with international government and non-governmental organizations. Finally, awareness should be provided for the community, especially those living in the rural parts of the country. The study showed that engaging primary healthcare units, including health posts, is crucial in preventing and controlling NCDs. Further, capacity building of the health care providers through short-term training at the lower level is critical for the early detection of NCDs.

To mitigate the supply and demand-side challenges, effective engagement of the health care providers, proper supply of basic logistics and medications, networking with NGOs and private health facilities would bring a better option for Ethiopia's challenges in urban and rural parts. PHC providers should also be trained in patient handling and communication skills to bridge the gap between the health care provider and the patient. In addition, serious attention should be given to financing NCD-related services at the federal level.

Strength and limitations

This study is the first qualitative study in Ethiopia, allowing patients of DM and HTN and health care providers to explain their experiences and views regarding the supply and demand side facilitators and barriers of early detection of type II DM and HTN. The limitation of this study is that we cannot include other neighbouring regions and concerned bodies from the ministry of health due to budget constraints.

There were also a number of limitations to the present study. The outcomes were evaluated only six weeks after the educational intervention. Thus, future studies with longer follow-up periods are recommended for better evaluation. In addition, the blood glucose evaluation was based on the fasting blood glucose only.

This study was conducted based on the anthropometric, clinical and biochemical tests which could be a source of bias. Hence, future studies can use a combination of self-reports, direct observation of the behaviour, and parents report.

Ethical approval and consent to participate: This study was approved by the Institutional Review Board of Hawassa University (IRB), Ethiopia, and Number IRB 072/13. Written informed consent was obtained from the study participants.

Conflict of interest: All authors declared that they have no competing interest

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