

Exploring Barriers and Facilitators to Accessing TB Health Services: Perspectives of Persons with TB, Caregivers, and Health Workers Using the Levesque Framework

Semei Christopher Mukama

mukama.semei.christopher@gmail.com

Infectious Diseases Institute, College of Health Sciences, Makerere University

Rita Makabayi-Mugabe

Infectious Diseases Institute, College of Health Sciences, Makerere University

Stavia Turyahabwe

National TB and Leprosy Program, Ministry of Health, Uganda

Ignatius Senteza

Infectious Diseases Institute, College of Health Sciences, Makerere University

Adelline Twimukye

Infectious Diseases Institute, College of Health Sciences, Makerere University

Priscilla Ajambo

The Aids Support Organisation

Leus Tweenatwine

Infectious Diseases Institute, College of Health Sciences, Makerere University

Philip Tumwesigye

Infectious Diseases Institute, College of Health Sciences, Makerere University

Henry Luzze

National TB and Leprosy Program, Ministry of Health, Uganda

Stephen Mulindwa

Mukono District Local Government

Daniel Okello

Kampala Capital City Authority

Stella Zawedde-Muyanja

Infectious Diseases Institute, College of Health Sciences, Makerere University

Mary G. Nabukenya-Mudiope

Infectious Diseases Institute, College of Health Sciences, Makerere University

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Abstract

Background: Barriers to access to tuberculosis (TB) care are a major obstacle to achieving the national and global targets of ending the TB epidemic by 2030. We conducted a qualitative study to understand these barriers and design interventions to improve access to TB services in Uganda.

Methods: We purposively selected persons on treatment for drug sensitive tuberculosis (DS-TB). We included those living with HIV and caregivers of children with TB. We carried out focus group discussions and in-depth interviews. Data was collected and analyzed deductively in line with the Lévesque framework using NVivo 12.

Results: We interviewed 96 persons with drug-sensitive tuberculosis (DS-TB) and 11 caregivers of children with TB. We found barriers along all of Lévesque's five domains of access to care among. We found insufficient knowledge about TB symptoms among respondents which hinder their ability to perceive that they need TB care services. This hindered their ability to seek appropriate care for TB symptoms instead preferring herbal medication and spiritual healing. When persons decided to seek appropriate care, long distances to health facilities hindered their ability to reach TB care services. Furthermore, the lack of money to pay for medical and non-medical costs associated with TB care e.g., transport and chest X-rays, hindered their ability to access TB care services. Finally, the lack of adequate numbers of healthcare workers decreases the time available for meaningful engagement with TB care services because healthcare workers do not devote adequate amounts of time to patient education and counselling. Major emerging themes among facilitators for accessing TB care included preference for community-based interventions, quality patient-health worker relationships, availability of diagnostics and free drugs, proximity to health facilities, and individual-level factors (self-motivation and reminders by treatment supporters).

Conclusion: The study underscores the need for multidimensional approaches addressing individual, community and health system factors to improve access to TB care.

Background

Tuberculosis (TB) is a communicable disease that is a major cause of ill health and one of the leading causes of death worldwide [1]. In 2020, a staggering ten million individuals fell ill due to TB globally. Of these, 1.5 million died from the disease (1.3 million HIV-negative individuals and 214,000 persons living with HIV) (1). scale. Globally, limited access to TB diagnosis and treatment results in several additional TB deaths each year. According to the WHO Global TB report, 3.6 million people with TB were missed by health systems in 2020 resulting in additional morbidity and mortality from TB. [2].

Uganda is one of the 30 countries high TB and TB/HIV burden countries in the world. In 2020, an estimated 90,000 (range 54,000- 135,000) people in Uganda fell ill with TB and 16,000 died (including 9,000 deaths among people with HIV). The annual TB incidence is still high at 196/100,000 population, with men contributing the majority of cases (71%) while children contribute 13% [3]. The TB treatment

coverage (for the year 2020/21) was 843.9% with the lowest treatment coverage observed in the age group of 5–14 years. Even though TB services are free in public health facilities in Uganda, access to TB care remains sub-optimal. In 2020, about 30,000 people in Uganda with TB symptoms were not notified or diagnosed(5). Delays in TB diagnosis and treatment initiation among TB patients, not only increases the infectivity of the disease in the community, but also leads to more advance disease states, which result in more complications and expose patients to higher risk of death.

The goal of the Ministry of Health in Uganda is to achieve universal health coverage (UHC) defined as ensuring that all people having access to the needed health services of sufficient quality without incurring catastrophic costs (5, 6). In order to achieve this goal, the Ministry of Health must realign its health services to reach people where they initially seek care. A deeper understanding of barriers to access to TB health care that are either behavioral factors (patient related) or health system factors is critical to the successful realignment of healthcare services. (5). Our study aimed to qualitatively examine the barriers to TB care and recommend interventions to improve access to these services within the Kampala, Mukono, and Wakiso Districts (KMW) metropolitan area.

Materials and Methods

Study setting:

The study was carried out in Kampala, the capital city of Kampla and two surrounding districts (Mukono and Wakiso).. The combined population of the three districts was estimated at 5,785,400 in 2020. More than two-thirds (2/3) of the population are aged below 25 years. Almost two-thirds of the population earn income below the poverty line of USD 2/day (the working poor). These segments of the population live in slums or densely populated urban settlements where over-crowding, malnutrition and alcohol use disorder promote the spread of TB. These factors lead to very high TB notification rates. In 2020, approximately 20% of total national TB notifications (10,424 patients) were from these three districts.

The three districts also have a higher HIV prevalence than the national average (8.7% vs 6.8% among women and 4.5% vs 3.9% among men. This leads to a high HIV co-infection rate among patients diagnosed with TB (46% against a national average of 38%).

Finally, the three districts, as shown in Fig. 1, A map of Uganda showing the three focus districts for the LPHS- TB Activity of Kampala, Mukono, and Wakiso, are home to other key populations for TB, like urban refugees (90,000 urban refugees and asylum seekers in 2020) (6). The refugee settings have many challenges, including overcrowding, malnutrition, and poor TB knowledge, which increase vulnerability to TB (7).

Study design:

We conducted a qualitative study using the Levesque framework to elicit barriers to and facilitators to access to TB care services. The study developed tools, including a key informant interview (KII) guide, an in-depth interview (IDI) guide, and a focus group discussion (FGD) guide, to collect primary data per the framework. The tools are attached as supplementary file 1 to this manuscript.

Conceptual framework:

The conceptual framework for this study as shown in (Fig. 2: A conceptual framework adapted and modified from Levesque et al (9) illustrating how the five abilities of individuals interact with the dimensions of accessibility to influence access to TB care) lays out five concepts of access to healthcare services and illustrates the interplay between communities (abilities of populations) and the health care systems (dimensions of access to TB care) in determining access to healthcare services. This framework provides a clear depiction of how various factors interact, both at the individual and health system levels, influencing access to care. It has been successfully utilized in previous studies related to multidrug-resistant tuberculosis (MDR-TB), patient perspectives on barriers to TB care, and access among migrants and refugees (9–11, 22) and in other health related fields(23).

According to this framework, The patient interacts with the health system in a step-wise fashion from their ability to perceive the need to seek a service that is determined by accurate knowledge of TB signs and symptoms and where to seek care, to their ability to overcome obstacles like stigma, cultural norms, myths and beliefs at the household and community level, to the ability to reach the health facility and receive care in a professional manner by a team of health workers. This can only be made possible by their ability to pay both direct and indirect cost of seeking TB care for the entire duration of treatment 6 months for DS-TB patients and 12–24 months for DR-TB patients)(24). The last step in the framework is the patients' ability to engage with the health providers which may be determined by the quality of care. The framework further illustrates the dimensions/ health systems perspectives to service delivery. Services can be more or less known among various social or geographical population groups, affecting the ability to seek care (approachability), while social and cultural beliefs of a community determine uptake of services (acceptability). Availability and accommodation refer to the fact that health services (either the physical space or those working in health care roles) can be reached both physically and in a timely manner. It constitutes the physical existence of health resources with sufficient capacity to produce services. The economic capacity for people to spend resources and time to use appropriate services (affordability) either through direct or indirect costs is critical to access of TB care. Quality of care (appropriateness).

Study population:

Selection of health facilities:

Health facilities were selected based on their performance on key performance indicators (treatment coverage and treatment success) for the recently concluded performance period 2021. Two health facilities in each of these three performance categories from KMW were purposively selected as part of the study sites. A total of 18 public health facilities, three private-not-for-profit (PNFPs) and three private-for-profit (PFPs) health facilities were selected and included in the study.

Selection of TB patients:

Patients on TB treatment for less than three months prior to the commencement of the study were selected. The shorter duration aimed to minimize bias in recall regarding their lived experiences regarding access to TB care and interactions with the health system. Due to differential challenges and experiences in the process of access to care and along the TB cascade of care, different patient categories were sampled and interviewed that included; DS TB patients bacteriologically diagnosed (PBCs), DS TB patients clinically diagnosed (PCDs and EP) and caretakers of children diagnosed with TB

Participants were included in the study if they were 15 years and above and were willing to provide written informed consent or assent (15–17 years), Participants were excluded from the study, if they were involved in any ongoing research study because involvement in such a study could have helped patients overcome some barriers to TB care e.and therefore their experiences may not be a true reflection of the realities on ground.

Sample Size Determination:

A purposive sample of TB patients, caretakers of TB patients, health workers, and health managers was selected. Data collection was carried out through FGDs and KIIs until saturation was achieved, when no new themes emerged or arose from the discussions (8, 9).

Data Collection Procedures:

Trained research assistants (RAs) on all the tools (KIIs, IDI, FGD guides), worked closely with TB unit in-charges or designates to identify patients who met the eligibility criteria using the unit TB registers. Those who were eligible were contacted by telephone by RAs or visited at home (for those without telephone contacts) and asked if they were willing to participate in the study. An appointment was then made with the potential study participants for the FGD interview, or KI interview, which would take place, including the time, place, and duration of the interview. Participants were reimbursed for their transportation costs to agreed-upon venues. Consequently, 14 focus group discussions (FGDs), and 14 KII were carried out, as shown in Supplementary Table 1, showing the description of the sample sub-groups with the number of FGDs/KIIs that were conducted

Data analysis

All audio recordings from individual interviews and FGDs were transcribed verbatim for subsequent analyses coupled with notes taken during the interview process. A coding framework was developed based on the Levesque framework(10). Twenty-five percent of the transcripts were manually reviewed and coded to generate initial set of codes. The codes were typed into NVivo version 12 to create the study coding framework. All transcripts were imported into NVivo and coded. To ensure trustworthiness, transcripts were coded independently, compared and discussed. Discrepancies were resolved by mutual agreement (11). The revised codes were grouped into identified categories/ themes. Illustrative quotations for each emergent theme was selected.

Results

From October to December 2022, we conducted qualitative research to examine the barriers and facilitators to accessing TB care among drug-susceptible TB (DS-TB) patients, their caregivers, and healthcare workers. Our study involved 63 patients/caregivers, 26 community health workers, 28 health workers, and 8 health managers who participated in FGDs and KIs. 9 participants from the patients/caregivers were unable to attend the discussions. These participants were not replaced, and among the health workers that participated (72.6%, 45) had been in service for more than 5 years, followed by (25.8%, 16) who had served between one and five years, as observed in Table 2 showing the Socio-demographic characteristics of study participants.

Table 2 showing the Socio-demographic characteristics of study participants

Variable	Number (n)	N = 125
		Percentage n/N(%)
Respondent's Category		
TB Patients	52	41.6
Caretakers	11	8.8
Community health workers	26	20.8
Health care workers	28	22.4
Health managers	8	6.4

Abilities of populations:

Ability to perceive the need to seek care and where to seek care:

Although the study respondents demonstrated adequate knowledge about TB transmission, signs and symptoms, they expressed concern that these were not widely known within their communities.

“Now, it [TB] is transmitted when an infected person coughs without covering their mouth. In fact, if an infected person has not yet been initiated to treatment, it becomes easy for them to transmit TB to other people” [FGD, adult females, Kampala].

But *“What I know, is people in my community are not much aware about TB. They don’t know how you acquire TB but they know that TB is there and very dangerous but they don’t know how someone acquires it”*. [FGD, adult male patients, Kampala]

Participants also expressed concern that in some cases, TB may not exhibit the typical symptoms, such as a persistent cough, leading individuals to overlook the possibility of having TB. This lack of recognizable signs can result in denial and disbelief when they receive a TB diagnosis.

“I have not experienced any serious challenge so far except for my head sweating in the night.... Yet initially, I was in denial and I could not believe that I was infected with TB since I did not experience all the signs of TB. So, they took my sputum for testing. Thereafter, they diagnosed me with TB and I said, “That is a lie.” In fact, initially, I rejected the medical report...”. [FGD, adult female patients, Wakiso]

The majority of patients sought TB services from government or public health facilities, where TB treatment was readily accessible and provided free of charge. These facilities were preferred due to the effectiveness of the prescribed drugs and their proximity to the patients' residences. It was relatively convenient for most patients to reach the health facility in less than an hour, indicating ease of access. Additionally, the public health facilities demonstrated good follow-up mechanisms to ensure patients' ongoing care and monitoring.

“If you discover that you have TB, the best place is the government hospital.... TB can be cured only by receiving effective drugs and following the instructions they [the healthcare workers] give you, you must follow them not missing any you swallow the medicines according to healthcare worker’s prescription”. [FGD adult male, patients, Kampala]

“... in most of the government hospitals, there are TB drugs yet they are for free because for me the older child is treated from there...”. [FGD, adult Children Caretakers, KMW]

Male participants preferred seeking care for their cough symptoms from private clinics or pharmacies. They expressed this preference because they wanted to avoid being perceived as severely ill. Additionally, they disliked the long queues at government health facilities and the reported scarcity of drugs, as well as instances where they felt coerced into paying additional money for services at those facilities.

“That is why people go to pharmacies or clinics they fear going to the hospital, they think somebody seen at the hospital is somebody very sick.....”. [FGD, male, TB patients, Kampala]

"We just spend a lot of time just waiting in the queue. We will not bother going there..." [FGD, adult male TB patients, Mukono]

Ability to seek TB treatment:

Despite having TB-related knowledge, the ability to seek care is determined or affected by the cultural norms and belief systems related to TB disease in a given community. The common belief that TB was associated with witchcraft, the preference for herbal medications to treat cough and only seeking conventional treatment when health conditions deteriorated posed major barriers to access to TB services.

"I for instance felt pain before I began to cough. The cough came in later. You may think that someone is bewitching you and resort to the witchdoctors in the shrines" [FGD adult male, patients, Kampala]

Internal stigma, external stigma and discrimination coupled with the psychological impact at the individual, household, and community levels pose as a major barrier to accessing TB services with some participants preferring an HIV diagnosis, yet TB is curable!

"They spread gossip about how you are infected with TB. Everyone looks at you with contempt. In that way, they discourage you and if you are weak, you may end up stopping the medication...." [FGD, adult female patients, Kampala]

Others come to me and say, which kind of medicine are you taking every day?" I tell them, "I have HIV. I am taking ARVs" I just tell them that it is HIV. If I tell them that it is TB, they think that I have HIV." [FGD adult female patients Kampala]

Ability to reach

The ability to reach a TB diagnosis can be influenced by various factors. Patients often encounter different pathways to diagnosis, and these journeys can involve delays and obstacles. Aside from the delays encountered while seeking care from alternative care providers e.g., herbalists or traditional healers, further delays may be experienced even after reaching the health facility. These delays were attributed to factors such as the availability of diagnostic tools and healthcare workers.

"There are very many patients and less equipment. Some people here take a week without getting their results..Our Xray is outdated and can't bring out clear pictures that the doctor wants and they end up sending us to a far distance like a referral hospital to get an Xray..." [FGD, male, adult patients, Kampala]

"We have few doctors—sometimes, you find them busy performing other tasks and you have to wait a moment for them to finish what they are doing so that they can attend to you. That is the challenge I have observed among the doctors" [FGD, adult male patients, Wakiso]

Ability to pay

Inability to pay direct costs of care for TB services was a major obstacle for TB services that included transportation fares, challenges paying for diagnostics like x-rays, and lack of food during the course of treatment. Indirect costs were the loss of employment due to TB affecting income. They noted that free treatment is helpful and would not have been able to afford it if they were required to pay.

“However, I encounter a challenge of lack of food such as my own food and drinks. I reach a point when I want to drink and eat yet I do not have the food. Sometimes, they may call us when the date is due like yesterday yet I have no money for transport and I have no plan at the moment.” [FGD, Female patients, Mukono]

Ability to engage

Quality of care is affected by the patient-health-provider relationship expressed through attitudes, counseling, and adherence support to help them walk through the journey of treatment through reminders and follow-up mechanisms.

“The health workers treat us well... and they also spared time to come to my home, as well as giving me medicine....” [FGD, adult female patients, Wakiso]

“In fact, the TB really affected me adversely. However, he (doctor) counseled me and told me, you are not treating sugar diabetes which is very unlikely to cure but it is guaranteed that you will be cured from TB when you adhere to the medicine.” So, he encouraged me and I had hope in me that TB is curable. So that kept me pushing and adhering to the medication because of the hope I had but it is not easy” [FGD, adult female patients, Wakiso]

Dimensions of access to TB care: Health facility perspectives

Approachability

Most of the healthcare workers said they shared information about TB with the community through health education talks delivered at all health facility entry points, through IEC materials in both English and the local languages posted at the health facilities and in the communities and by holding radio talk shows. Healthcare workers also noted that implementing community-based activities including door to door TB screening, outreaches and home-based contact tracing increase the level of knowledge within the population.

“At the facility, health education is a must. ...because in the public health facility settings, it is easy to offer health education.....” [KII_ DTLS Kawempe_Health Manager]

Healthcare workers also noted that use of peer to peer mobilization efforts by those already initiated on treatment helped create awareness about TB services in the community. *“Those who are already on*

treatment also help us mobilize their peers and they give us updates saying, “In this village, there are certain people whom we drink alcohol with and they are also coughing.” (FGD_CHWs_Wakiso)

Finally, engagement of community structures has been useful in increasing access to TB services particularly among patients who would have been traditionally difficult to access.

“The local council leaders often move around the villages to reach out to community members. They may approach you as a VHT and tell you that as I passed through this area people were coughing, you should pass by and see. When you go there, you may find like 3 TB cases. After getting such information we make that area a hot spot. When you continue going back to that area you get more cases but initially, that information was the LC” [FGD_CHWs_Mukono]

Availability and accommodation

The implementation of active TB case-finding interventions both at the facility and in the community have increased the availability of TB care services.

“We emphasize TB screening at every entry point and have TB screening on antenatal days. We also have TB screening in our maternity ward that is at the facility because here we also have a cough monitor who moves around at every station. [KII_Healthworker_CHP]

However, the insufficient diagnostic capacity at the health facilities led to delays processing of sputum samples leading to long turn-around-time for TB results Patients asked to return to the health facility for their results. Those asked to return sometimes don't return leading to delays in TB treatment initiation or missed opportunities for treatment initiation.

“We are not able to give patients their results as soon as possible.....We are not really responding to their needs in that aspect. If we really care about patients, we should give them a same day result. Why do they have to wait? ” [KII_Health Manager_DLFP Nakawa_Kampala]

Healthcare workers also noted that Pediatrics is hard to diagnose because children are not able to cough out bacteria:

“For example among the children, a negative test does not confirm that a child is free. So, it helps us as a team to diagnose these patients as a team because we use the diagnostic algorithm and the b' symptoms and then, we are able to diagnose this child—because there is a challenge with children. You can do a gene-expert and it turns out negative. The microscopy may out negative. The x-ray can even come out to be normal yet the child is infected with TB. So, with other supportive symptoms and as a team, we are able to diagnose children because they have what we call ‘pulse TB’ Bacillary TB. They are not able to cough out the bacteria but when we initiate them to treatment, they become fine” (FGD_HW_Wakiso).

Affordability

Financial constraints limit activities like outreaches and the Health care workers emphasised that the costs for TB diagnostics like gene-expert forexample on islands, x-ray existed yet patients could not afford. One participants said diagnosis costs for X-ray made it unpopular among patients: patient inability to afford food and transportation costs (catastrophic costs)

“On top of the transport challenge, they usually tell you, “I did not have anything to eat and I failed to swallow the medication, skipped some days. Thus, I still had some medication left and that is why I did not show up on the clinical appointment day.” They have a challenge. Some attribute it to lack of food and others, to transport” [FGD_CHWs_Wakiso]

Appropriateness

Facilitators

Health workers noted that differentiated care models are a better fit for patients as they are patient-centered and aimed at supporting them in the unique circumstances that they find themselves. These include individualized drug deliveries, TB health services at home and adherence support. *“We started the DSD model. If want home delivery, they will bring the drugs to you. It is convenient for the patients. They are the ones actually calling us in advance and telling us, “I am now busy. I will not come there. Please give my drugs to the motorcycle rider to deliver them.” Before, that was not existent. It is responsive to the needs of the community—because we now have options but before, we had one model which was facility based” [FGD_HW_Wakiso].*

The use of digital health technologies for adherence monitoring has shown to facilitate good outcomes. *“There is a program which came, it was called dots; actually, this one did us some good work. That the patient comes, is given a phone, and when he is given a phone and takes the medicine, there is some codes he enters and we get alert that this person has taken the drugs. If he doesn’t, the system when we go there it is going to show this person has already not taken the drugs. So, it gave us a very good way of monitoring patients and actually was ensuring adherence; as much as we are not there, somebody might just open drug and maybe throw away. But we heard the patient maybe took the drug because this code was supposed to be got; after plucking the drug out, then you see this code and send” (KII_DTLS_WAKISO).*

Barriers

In circumstances where TB and HIV services are not integrated with harmonized return visits poses barriers to care through non-adherence especially to TB medications. Implementing mechanisms operating in silos without involvement of district structures also affects appropriateness of TB services.

Bill burden and size of tablets was another barrier as it affected adherence of some patients with preference for injectable modalities

"We find some patients who may tell us, they bring suggestions that 'why don't they bring injections, me I don't want tabs, don't want to swallow every day every day but if I come to the', 'maybe they give me one injection one for a month like that, why don't they do those things'. We see that uh pills are a burden and taking drugs every and the drugs are big. So mostly the drugs are big, soar for the children, they have to crush and even the colour. Yeah, mostly those are the challenges the clients tell to us"

[FGD_HW_Mukono].

Poverty and a lack of social support noted by health workers during community outreaches and home visits affecting their ability to return for return visits through the follow up period. *"The biggest challenge also we are having uh most of patients are very poor and the treat is for long for sure for six months treatment so it becomes difficult for most of these patients to continue coming for follow-ups up to six months. However, we have tried to for some few cases that uh within our area we do home delivery but it is a challenge"* [KII_ DTLS Kawempe_Health Manager]

Smoking and alcohol use affects adherence and retention in care. *"People don't have enough food and when you start them of treatment others even tell you these drugs make me to get appetite but i have no food in the house and they stop taking the drugs. Then we also have many of them who are alcoholics they do abuse drugs and they don't want because they know when are on drugs. On TB treatment, we normally advise them not to take drugs at the same time take alcohol at the same time. So, when they feel much better, they stop the anti TBs they go back to their lifestyle of taking alcohol which they are used to"* [KII_ DTLS Kawempe_Health Manager]

Recommended Interventions

Patient/Caregiver Perspectives (Individual Level)

Enhancing patient education and awareness is crucial in addressing misconceptions about TB transmission and treatment. Patients and caregivers should be continuously informed about the importance of timely diagnosis, treatment adherence, and non-compliance risks. Community health workers can support this education by providing regular follow-ups and reminders, helping alleviate fears and ensure proper care. As one patient noted,

"TB can be treated... if you start medication without defaulting and follow what the health workers tell you" (FGD adult female, Children caretakers, KMW).

Community-Level Interventions

Community-based initiatives should focus on reducing stigma and increasing TB awareness. Engaging local leaders and community health workers to conduct regular sensitization campaigns can help dispel myths and encourage people to seek treatment early. The community's role is pivotal in supporting TB patients through social support systems, which can improve treatment outcomes. One participant emphasized,

"The suggestion of doctors reaching out to the community is a good one because when I was initiated to this TB medication, the doctor educated me about the people termed as "carriers" who get infected with TB and do not suffer from any signs but keep transmitting it to others. However, it is wise for the carrier to also test, get treatment to fully recover and stop transmitting it to the neighbors—because a carrier does not show signs of TB yet they are infected with it. (FGD, adult male patients, Mukono)

Health Facility Interventions

Health facilities should strengthen their capacity to provide patient-centered care by ensuring consistent availability of TB medications, reducing wait times, and improving diagnostic services. Introducing incentives such as food, transport, and financial support can motivate patients to adhere to their treatment regimens. Additionally, incorporating technology for patient follow-up, like reminder calls or messages, can significantly enhance treatment adherence.

"I appreciate the doctors because there is no single day that I came here and failed to find a doctor to attend to me and look after me as a patient. The doctor encourages you to swallow the medication and if you were discouraged, you regain the motivation to swallow the medication. That is what I appreciate them for" (FGD, adult male TB patients, Mukono).

National -Level Interventions

At the policy level, the government should focus on scaling up free TB screening and treatment services to reach all communities, particularly underserved areas. Implementing mass screening programs and ensuring a steady supply of essential medicines are critical. Furthermore, government policies should promote integrating TB care into broader health systems to facilitate access to services across different facilities.

"The government did a great job to give us this service free of charge"((FGD, adult female patients, Mukono).

Discussion

In this qualitative study, we explored the barriers and facilitators to accessing tuberculosis (TB) health services in Uganda, focusing on the perspectives of persons with TB, their caregivers, and health workers using the Levesque Framework. The findings reveal complex, multifaceted barriers that affect patients' ability to perceive, seek, reach, pay for, and engage with TB care, alongside facilitators that can be leveraged to improve access and outcomes per the Levesque Framework.

Ability to perceive:

The ability to perceive the need for TB care was found to depend on individual and community knowledge. The findings revealed that knowledge gaps remain prevalent, particularly regarding TB symptoms and the transmission models. These were categorized as barriers to accessing TB in the detail below.

Barriers to Accessing TB Care

The study identified significant barriers at both the individual and systemic levels[5]. In line with a study by Shifa and her colleagues[6], the barriers were categorized per the social-ecological model and the findings highlight the barriers at different levels. At the individual level, knowledge gaps regarding TB symptoms and transmission were prevalent, particularly in rural areas[7], [8]. This lack of awareness often leads to delayed health-seeking behavior, as some individuals fail to recognize the symptoms of TB or attribute them to less severe conditions. Furthermore, cultural beliefs and stigma significantly hinder access to TB services[8]. The association of TB with witchcraft and the preference for herbal remedies over conventional medicine are major obstacles, delaying the initiation of appropriate treatment. Uganda grapples with traditional healers who continue to confuse patients with wrong diagnoses and non-accredited labeled herbal syrups as drugs for treating TB. The fear of social stigma, particularly the association of TB with HIV, also deters individuals from seeking timely diagnosis and care, as they fear being ostracized by their communities[6], [8], [9]. A study by Sha et.al that explored barriers and facilitators among patients seeking TB care in private health facilities showed similar barriers to those of the public healthcare sector when it came to some barriers[9].

Ability to seek and reach:

Systemically, characteristic of any developing country[10], the ability to reach TB care in Uganda is compromised by logistical challenges such as long distances to health facilities, lack of transportation, and inadequate diagnostic tools at health centers[11], [12], [13]. Studies that reported on barriers to accessing TB care had similar challenges to those reported by this study although they categorized these as economic constraints [13] and socioeconomic[7]. The listed barriers are exacerbated by long waiting times and shortages of health personnel [12], which further delay diagnosis and treatment initiation for those patients who have managed to reach the health facility are systemic constraints that increase patient frustration and limited service utilization. Financial constraints disproportionately affect economically disadvantaged patients, who struggle to afford travel costs or, in some cases, basic food to maintain their health during treatment. Geographical and logistical challenges impede many patients' ability to physically reach TB care services.

Ability to pay

The high cost of care, including transportation and diagnostic services like chest X-rays, poses a significant barrier, especially for economically disadvantaged patients[11]. Whereas TB drugs are free in Uganda, the cost of services refers to those other expenses that facilitate a patient to access care. This was noted to be a challenge for studies conducted in low-developed countries. A study by Habib et al. that focused on women highlighted their limited autonomy in household financial decisions as a big problem that affected women and young girls to quickly access TB care[6].

Facilitators to Accessing TB Care

Whereas the study recorded numerous barriers, several facilitators were identified that are contributing to access and once focused on, they could further improve access to TB services. Community health workers play a crucial role in bridging the gap between patients and health facilities[14], [15], [16]. Their involvement in community sensitization, patient follow-up, and provision of health education was found to have been instrumental in improving TB awareness and promoting health-seeking behavior[11]. Uganda has a system of using community health workers to reach their communities through the extension of health services to the communities by mainly offering referral linkages. This helps to have many presumed TB patients referred for care and also followed up [12]. Moreover, the availability of free TB drugs at government health facilities is a significant facilitator, making treatment accessible to patients who would otherwise be unable to afford it. Uganda provided TB treatment drugs to its patients at no cost. If this drug was being sold, the results would have been similar to the studies in Europe where utilization of ant TB is low because of cost[17]. Studies in Uganda have indicated other various barriers but buying ant TB has not been recorded anywhere as a barrier[18].

Ability to engage

The patient-health provider relationship emerged as a facilitator of engagement in TB care, with patients expressing appreciation for supportive and empathetic health workers. This positive interaction enhances treatment adherence and retention in care, a crucial indicator for TB treatment success. Studies show patients recognition of healthcare workers' support in their recovery process during treatment [19], [20], [21]. Digital health technologies, such as reminder calls and SMS follow-ups, also provide promising avenues for improving adherence and engagement. Expanding these digital strategies across facilities could support consistent patient monitoring and follow-up, particularly for those in remote locations [22], [23].

Implications for Policy and Practice

The findings underscore the need for a multidimensional approach to address the barriers to TB care in Uganda. At the individual level, there is a need for ongoing education campaigns to raise awareness about TB symptoms, transmission, and the importance of early treatment [7]. Culturally sensitive interventions are essential to address the myths and misconceptions surrounding TB, particularly in rural areas[24].

At the systemic level, improving the availability and accessibility of diagnostic tools and services is crucial. This includes ensuring that health facilities are adequately staffed and equipped to handle the diagnostic needs of TB patients. Additionally, policy interventions should focus on reducing the financial burden of TB care by providing transportation subsidies or integrating TB services with other health programs to reduce costs for patients.

Finally, strengthening the role of CHWs and enhancing the patient-health provider relationship through training and support can significantly improve patient engagement and treatment adherence. Leveraging

digital health technologies for patient follow-up and adherence monitoring should also be expanded as part of a comprehensive strategy to improve TB care outcomes.

Methodological consideration

This study fills an important gap in knowledge when it comes to facilitators and barriers to the uptake of TB care in Uganda. An important limitation to this study is desirability bias where participants presented a positively framed recounting of their experiences. The investigation team tried to mitigate this by reassuring participants of their confidentiality to all the shared responses. Another limitation was the predominant participants from 3 districts of Kampala, Mukono and Wakiso only. Findings should therefore be cautiously applied in other countries and areas since KMW is the urban part of Uganda comprising of the capital city and the metropolitan districts. Nevertheless, the study team described the study setting to improve transferability.

Conclusions

Addressing the barriers to TB care requires a holistic approach that incorporates individual, community, and systemic interventions. Policymakers and health workers should be aware of the facilitators contributing to the uptake and also address the barriers utilizing a multidimensional approach at individual and systemic levels. Promoting patient education through awareness, reducing stigma at community level, engaging leaders and community health workers when it comes to suppressing barriers and promoting a patient centered care from health facilities are ways to promote facilitators to uptake of TB services.

Declarations

Ethics approval and consent to participate

This research was performed in accordance with the Declaration of Helsinki guidelines. It was approved by the Joint Clinical Research Centre (JC1519) Institutional Review Board (IRB), and by the Uganda National Council of Science and Technology (HS2684) prior to study conduct. Administrative permission to collect this data were provided by the National TB and Leprosy Program and by respective study sites. Prior to interview commencement, written informed consent was voluntarily obtained from all participants. Confidentiality of patients was ensured by using study identification numbers and data storage protection procedures

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

SCM and RMM Conceptualization, development of study protocol, supervision of study implementation and initial manuscript draft; JM- Conceptualization and Data analysis; SZM- Conceptualization, protocol review, and supervision of RMM; EK- Conceptualization and Technical MDR TB input; HN- Data curation; ST- Study conceptualization, enabled administrative processes; AN- Conceptualization, overall supervision, and final approval of the manuscript. All authors contributed to the critical review of the manuscript.

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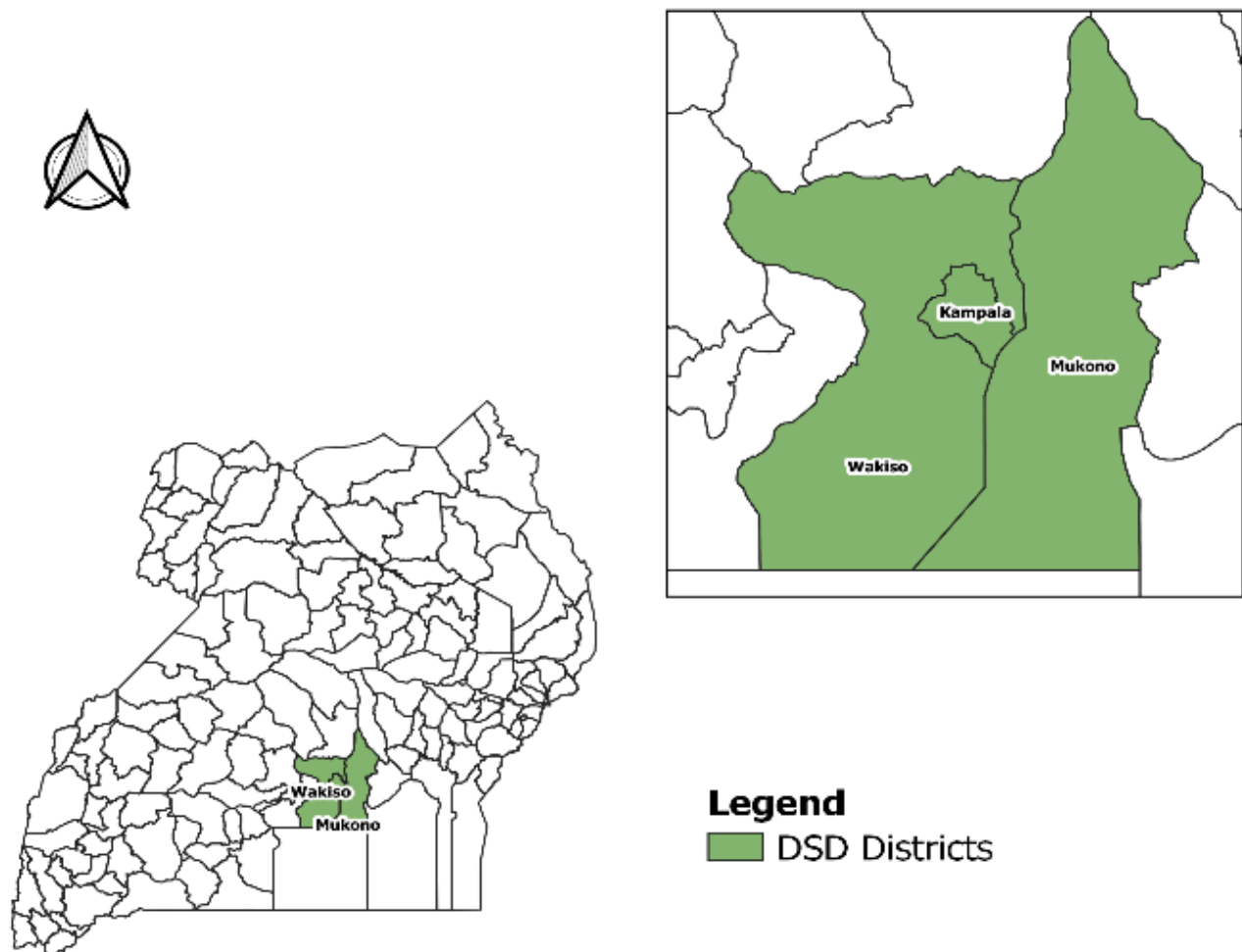
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Figures



Shape files:UBOS 2020, Data source:DHIS2

Figure 1

A map of Uganda showing the three focus districts for the LPHS- TB Activity of Kampala, Mukono and Wakiso

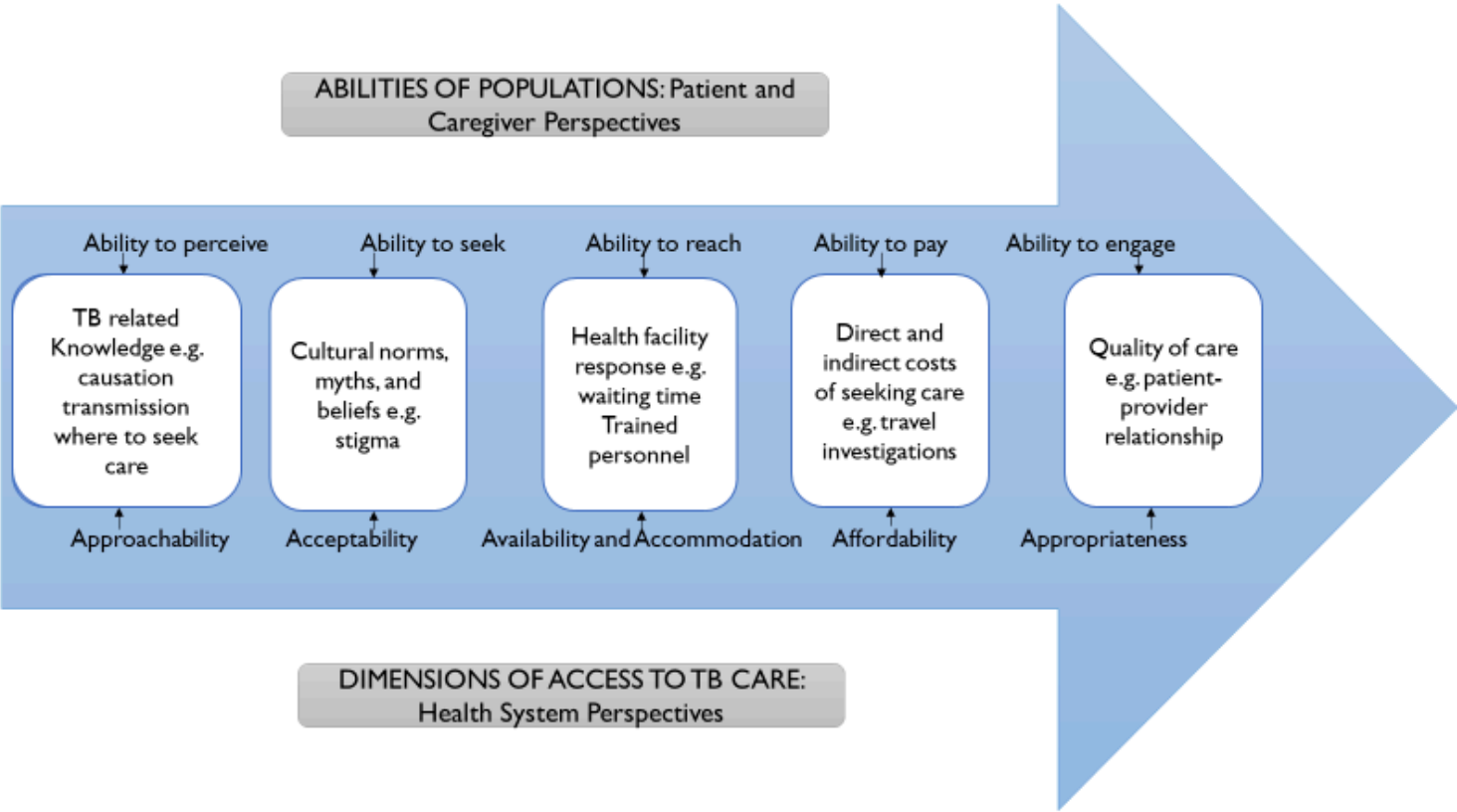


Figure 2

A conceptual framework adapted and modified from Levesque et al (9) illustrating how the five abilities of individuals interact with the dimensions of accessibility to influence access to TB care

Supplementary Files

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