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Perceived COVID-19 Vaccine Uptake and Effect on Delivery of Health Services in Tanzania: A Qualitative Study of Community and Health Workers

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Abstract

Background: The World Health Organization (WHO) declared the novel coronavirus a worldwide pandemic in March 2020. Since the coronavirus (COVID-19) is highly contagious, the number of confirmed cases and death rates has increased dramatically. The COVID-19 pandemic has caused significant morbidity and mortality throughout the world, as well as major social, educational and economic disruptions. Studies conducted in other low- and middle-income countries showed that health workers perceived the vaccine as beneficial; the benefits include preventing infection and limiting the severity of the disease. Despite myths and misconceptions which are reported to contribute significantly towards vaccine hesitancy in several African countries, there is a scarcity of systematic documentation of health workers and community perceptions on how the COVID-19 vaccine impacted the delivery and uptake of other services in Tanzania.

Objective: This study assessed and documented health workers' and community perceived uptake and impact of COVID-19 vaccination on the delivery of other services in Tanzania.

Methods: A phenomenological cross-sectional study among 632 healthcare workers at all levels and community leaders was conducted using interview guides for key informants, in-depth interviews, and Focus Group Discussions. The collected data were analyzed using a thematic analysis approach.

Results: In this study, six themes emerged, namely COVID-19 vaccine uptake, hesitation and awareness, COVID-19 transmission and prevention, and the effect of COVID-19 vaccination on the delivery and uptake of other services. Most study participants indicated that they were aware of COVID-19 and could understand the mode of COVID-19 transmission. Participants identified several factors that contribute to vaccine hesitation in the country. Such factors included receiving mixed information on the COVID-19 vaccine, family influence and secretive manner of vaccine delivery. Participants indicated that a shortage of resources affected the delivery of other services. Nevertheless, other participants indicated that the COVID-19 vaccination program did not affect the delivery of other health services. Based on the participants' views, the country was unprepared to respond effectively to the pandemic.

Conclusion: The Ministry of Health, under the communication section, should raise awareness of COVID-19 and its means of transmission. Using community leaders and champions to deliver appropriate information on COVID-19 vaccination may increase vaccine uptake and prevent misconceptions among community members.

Keywords: COVID-19, perception, health workers, community, impact, Tanzania

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Introduction

The World Health Organization (WHO) declared the novel coronavirus a worldwide pandemic in March 2020 (Cucinotta & Vanelli, 2020). Since the coronavirus (COVID-19) is highly contagious, the number of confirmed cases and death rates have increased dramatically. (Cucinotta & Vanelli, 2020). The governments took several preventative measures to reduce the spread of the virus, including mandatory mask-wearing, social distancing, and national curfews. (Deressa et al., 2021; Jang et al., 2020) Furthermore, the governments worldwide have pinned their hopes on developing COVID-19 vaccines. (Dal-Ré et al., 2021; Joseph Becker, Landry Tsague, 2009).

Immunization against vaccine-preventable infections is considered the most cost-effective way of preventing morbidity and mortality caused by such infections. Global data shows that about 2.5 million child deaths are averted annually through immunization against common childhood infections like diphtheria, tetanus, pertussis and measles. (MacDonald et al., 2020).

The Tanzania IVD Programme, formerly the Expanded Immunization Programme, was established in 1975. The programme procures, stores, and delivers safe vaccines for vaccine-preventable diseases to children under two years of age, adolescent girls, and women of reproductive age. The IVD programme has occasionally added new antigens to the immunization schedule to reduce the number of unvaccinated Tanzanians and under-vaccinated children, especially those living in hard-to-reach areas, through routine immunization. (TDHS-MIS, 2016; USAID & MSCP, 2019). The Tanzania routine immunization schedule includes BCG (birth dose), OPV (birth, 6, 10, 14 weeks), PCV(6, 10, 14 weeks), Rota (6 weeks,10 weeks), DTPHepBHib(6, 10, 14 weeks), MR(9, 18 months), and HPV(9 years) for children and adolescents. Women of Reproductive age and pregnant women are offered TT (1st contact; +1, +6 months;+1, +1 year). (Banks et al., 2020). According to TDHS-MIS 2015-2016, the proportion of children with all basic vaccination coverage ranged from a high of 83 per cent in Central, Southern Highlands, and Eastern zones to a low in Southwest Highland zone (67 per cent) and Western zone(66 per cent). (TDHS-MIS, 2016).

The COVID-19 pandemic has caused significant morbidity and mortality throughout the world, as well as major social, educational and economic disruptions. Globally, as of 6th December 2021, there were 265,194,191 confirmed cases of COVID-19, including 5,254,116 deaths, reported to WHO[1]This virus, which causes respiratory disease, was identified as belonging to the Coronavirus family, and it rapidly spread to many other countries worldwide. (MoHCDGEC, 2021). Common symptoms of COVID-19 include a high temperature, continuous dry cough, and loss or change in the sense of smell and taste. About 80% of infected people have no or mild symptoms, and one in six people who get COVID-19 becomes seriously ill. (MoHCDGEC, 2021). Older people and those with underlying medical problems are more likely to develop serious illnesses or die from COVID-19.
Coronavirus control measures include social distancing measures, travel restrictions, closure of public spaces, washing hands with soap and running water or using sanitizers, and wearing face masks. (Hager et al., 2020). Scientists around the world are continuing to develop many potential vaccines for COVID-19. These vaccines teach the body's immune system to recognize and block the COVID-19 virus safely. As of December 2020, over 200 vaccine candidates for COVID-19 were being developed. Of these, at least 52 candidate vaccines were in human trials. WHO has approved nine COVID-19 vaccines in the Emergency Use Listing (EUL). They include Pfizer BioNTech, Moderna,

https://dx.doi.org/10.4314/thrb.v25i4.16

AstraZeneca, Sinopharm, Sinovac, Janssen, and Serum Institute of India Pvt.Ltd, Sputinik, and Bharat. Biotech (WHO, 2021). Five of these vaccines were recommended for introduction in Tanzania. They include Pfizer BioNTech, Moderna, Sinopharm, Sinovac, and Janssen (MoHCDGEC, 2021).

A stuy conducted in Zambia revealed that Health workers perceived the vaccine as beneficial; the benefits included preventing infection and limiting the severity of the disease. Moreover, FGD participants from urban sites expressed a negative attitude towards the vaccine. They believed the vaccine conferred no benefits. By contrast, participants from rural communities had mixed views; they needed more information about the vaccine benefits. Participants' attitudes seem to have been influenced by personal or family experience with the COVID-19 disease or vaccination; those who had experienced the disease had a more positive attitude. (Mashoto et al., 2024). In contrast, most young people believed they were not at risk of the COVID-19 disease. Misinformation from social media influenced their attitude. (Sialubanje et al., 2022).

The effectiveness of vaccines depends on vaccine availability and uptake and vaccine hesitancy; the latter can range from simple indecisiveness/doubt to outright anti-vaccination beliefs. (Dhama et al., 2021; Jairoun et al., 2022; Puri et al., 2020; Sialubanje et al., 2022). The WHO listed vaccine hesitancy as one of the top ten threats to global health in 2019. It is a critical barrier to preventing vaccine-preventable diseases. (Macdonald, 2015). Vaccine hesitancy is an important barrier to achieving high vaccination coverage and has been reported among various socio-demographics from educated populations (Dhada et al., 2021), who failed to appreciate the science of vaccines, to refugees in the USA. (Dhada et al., 2021). Despite the volume of literature on vaccine hesitancy, it has remained an elusive topic, particularly because of its complexity and the myriad factors affecting it. Some of the prominent reasons centre around the concerns of safety, potential adverse effects, and disconcerting rumours about vaccine's impact on fertility and pregnancy. (Chemali et al., 2022). Understanding how vaccines are perceived in a particular context and the factors affecting their acceptance (or absence) can offer a window to the potential success of vaccine rollout.

Vaccine hesitance has been reported both in Zambia and other countries and is an important obstacle to the fight against COVID-19. (Quinn et al., 2021; Thapar et al., 2021). Lack of knowledge about different types of vaccines is among the factors that influence vaccine hesitancy. (Larson et al., 2021). Low vaccine coverage has been attributed to the delay in accepting or refusing vaccination despite the availability of vaccination services.

Studies conducted in WHO regions indicated that the existence of COVID-19 affected access to other health services for HIV, malaria, routine vaccination, non-communicable diseases, and mental health. (Al-Zalfawi et al., 2021; Ciardi et al., 2021; Jairoun et al., 2022). Attention directed to COVID-19 worsened the health system challenges, which impacted the quality of care, hindered patients from accessing care due to the lockdown, and resulted in increased patient default.

In most countries, vaccine hesitancy, negative attitudes, and perceptions about COVID-19 vaccines have influenced vaccine hesitancy, leading to low immunization rates. (Al-raeei, 2020; Ali et al., 2024; Paul et al., 2021). A shift of social mobilization towards COVID-19 prevention may affect the uptake of routine immunizations and negatively impact routine vaccination. (Ali et al., 2024; Hager et al., 2020).

Materials and Methods

Study designs

A cross-sectional study was conducted using qualitative phenomenological approaches to collect data. (Hunter et al., 2019).

https://dx.doi.org/10.4314/thrb.v25i4.16

Data collection tools

Interview guides were used to collect data during Key informant interviews, In-depth interviews and Focus Group Interviews.

Study settings and population

The study covered all eight health sector zones in Tanzania and targeted community members, national-level IVD programme staff, regional health management teams (RHMTs), members from DHMTs, healthcare providers, and ward and village leaders.

Data collection and sampling procedures

In each selected region, two councils were randomly selected, and from each council, two wards stratified by rural-urban were randomly selected. In each ward, four villages/streets were selected; hence, 128 villages were sampled for the entire study. Thus, at each respective level (national, region, council, ward and village), the following key informants were interviewed: logistic supply chain officer RIVO, RMO and RRCHCO; DMOs, DRCHCOs and DIVOs; WEOs, W-EHOs, WECs; and VEOs and CHWs (Table 1).

This study was part of a larger study conducted country wide. The heterogeneity of FGD groups was women and men, with women aged 25+ and Men aged 25+. Purposive sampling was chosen to select participants due to their rich information as representatives of health workers about the study. Furthermore, women and men in FGD groups were chosen to represent the community based on their experience and age (Manera et al., 2019).

One village from each zone was randomly selected from the respective region for focus group discussions. In each selected village, four FGDs were purposively selected (young boys, young girls, men and women) were conducted giving a total of 32 FGDs (Saunders et al., 2018).

Table 1. Number of Interviewed Key Informants

Level	Proposed Sample	Interviewed
National	2	2
Region	24	20
Council	48	38
Ward	192	134
Village	384	173
FGD participants	384	256
All	**826**	**623**

Data analysis

The interviews were conducted in Kiswahili. Research assistants and note-takers Verbatim transcribed the FGDs and KIIs sessions. The qualitative personnel verified all transcriptions to ensure accuracy by listening to the audio and ensuring that what was written was the same as what was in the audio.

Four researchers reviewed transcripts, and interviews were coded using thematic analysis. The analysis involved multiple transcript readings by researchers to identify recurring themes. The authors then revised versions of the codebooks according to emerging themes. The codebooks were reviewed, and themes were redefined over several meetings until a consensus was reached on defining all themes. New themes that emerged during this process were defined and added to the codebooks.

https://dx.doi.org/10.4314/thrb.v25i4.16

All study team members coded all interviews and FGD transcripts and compared them for inter-coder reliability. The transcripts were re-coded, a new theme emerged, a definition was redefined, and a consensus was reached.

The transcribed and translated transcripts were then exported to NVIVO 12 software to support the analysis and process of qualitative data, particularly in grouping the subthemes based on the developed codes.

Trustworthiness of the data

Several criteria are used to evaluate the trustworthiness of qualitative papers: credibility, transferability, dependability and confirmability. (Guba E.G, 1981; Hager et al., 2020). In this paper, credibility was ensured by purposive sampling when selecting the study participants who were eligible for participation. These participants were key to our research question, "How does COVID-19 vaccination affect work performance?" Using IDs assisted in meeting the credibility of the study. Transferability was attained through the description of the context, and the findings of this study are expected to be implemented in other similar contexts. Dependability was attained based on the availability of quotations to support the description of the findings, indicating that the findings emerged from the participants' voices.

Ethical considerations

This study was approved by the National Health Research Ethics Committee of Tanzania (Certificate reference number NIMR/HQ/R.8a/Vol.IX/3981). Study participants provided verbal informed consent before the interviews and Focus Group Discussions. In addition, all ethical issues were considered during the study.

Results

Demographic characteristics of participants

We interviewed 623 (75.4%) of the planned informants. The majority (24.3%) of the participants were aged 20-24, with a mean age of 34. More than half (52%) were male. More than half (68.1%) were from rural settings. 14.9% worked as community health workers.

COVID-19 Awareness

The theme conveys how participants were aware of the disease and knew that it is a dangerous disease with no cure but can be prevented through vaccination. As expected, health workers, by their positions, were well informed and affirmed that vaccination greatly reduces the severity of the disease. They also acknowledge that vaccines are good for the people as per the informants' narration here under:

> *The truth is that the disease is dangerous. We have not been infected until now, but if we need to protect ourselves from COVID-19, we should vaccinate. Through vaccination, you can get antibodies that can protect you against COVID-19. If you get infected with the virus, antibodies act as soldiers that protect the body by fighting back the viruses while you continue doing your activities; you will not be severely affected* **(KII Number 1).**

 https://dx.doi.org/10.4314/thrb.v25i4.16

Anha, this is because I am a health personnel. The vaccine helps, and it is good. It has greatly reduced the harm that COVID-19 might cause, and transmission has been reduced greatly. Therefore, the vaccine is important and helps a lot **(KII Number 2).**

Transmission of COVID 19

Participants in this study showed that they understand how COVID-19 is transmitted. They also mentioned that it is transmitted through droplets, coughing, sneezing, and contact with contaminated hands, saliva, and sputum.

It is transmitted by coughing, sneezing, and messing up your hands with saliva and sputum. Shaking hands is also another way a person can get infected. (**KII Number 2***)*

Most of the transmission methods are through droplets that come out through the nose, so when an infected person sneezes, nearby people are exposed to the virus and get the infection. Eventually, that virus can cause harm to respiratory organs. Also, viruses can be transmitted through contaminated surfaces such as benches, plastic metals or anything. So, it is not always from a coughing person and spitted sputum (**KII Number 3***)*

I do not know exactly how this disease is transmitted. I cannot yet tell how the disease is transmitted because I do not fully understand how... I heard that viruses come from birds known as bats and are transmitted through the respiratory tract, but it is also dangerous to touch and share utensils with an infected person. ***(*****FGD_Males 25+ years**)

Prevention of COVID 19

Participants in this study indicated that they have ideas on preventing COVID-19. They mentioned social distancing, avoiding shaking hands, hand washing with soap using running water and sanitizers, and wearing masks to prevent the spread of the infection.

Some preventions, especially for businesspeople, include social distancing and not touching each other. Other preventions include using soap and running water, sanitizer, and avoiding crowding ***(*****KII Number 4**).

Firstly, protect your mouth and nose when sneezing using your elbow. Wear masks, wash hands using running water and soap, and use sanitizers. Those measures are used to prevent the spread of COVID-19 **(KII Number 2).**

*Many methods have been used to prevent COVID-19, especially avoiding congestion, travelling unnecessarily, washing hands frequently with clean running water and soap, and vaccin*ation (**KII Number 5**).

We are avoiding congestion, like sitting in groups, we are washing our hands frequently with clean water and soap, and we are wearing masks (**FGD_Women 25+ years**)

Availability of COVD 19 vaccines

The theme conveys that participants acknowledge the availability of the COVID-19 vaccine and that people who need it get it. In most of the study sites, mobile clinics for COVID-19 are conducted in areas such as churches and other places where people are congested. Furthermore, in collaboration with stakeholders such as WHO and JEPIEGO, vaccination campaigns are conducted in villages or

https://dx.doi.org/10.4314/thrb.v25i4.16

on the streets. Since COVID-19 vaccines are available, and uptake is low, healthcare providers visit households to educate on the importance of vaccines and vaccinate those willing to receive the vaccine. However, other participants reported a shortage of vaccines, as it was narrated by participants here.

> *We do not have problems securing vaccines. All the time, our facilities are stocked with the vaccine. Whenever clients need the vaccine, they get it easily. Secondly, we have mobile clinics to serve the communities, and when we visit them for other services, we also offer COVID-19 vaccine education and services. We also visit congested areas like churches and other religious places to provide vaccine information and services. Our visits extend to other institutions which harbour so many people. So, we go there to offer both vaccine information and services. In addition, we conduct vaccination campaigns in collaboration with other stakeholders such as WHO and JEPIEGO* **(KII Number 3).**
>
> *Aaah, I can say it is difficult to reach all people because there is a shortage of resources. We get a few dosages of vaccine. But when obtaining the dosage, the issue is how to deliver the vaccine to people who need it the most. We do not have the budget for household visits to provide the vaccine. On the other hand, you can be asked how you can stay with expired vaccines. Therefore, there is no way but to visit the households to increase access to the vaccine. I can say there is a shortage, but at the same time, accessibility is a challenge (***KII Number 3***).*
>
> *COVID-19 vaccines are readily available... They are in the street, but we are not making follow-ups of them as there are no seminars. That is why people are unwilling; you do not know if they are fake or original. Education is needed. Vaccines are available, and healthcare providers make visits to households to provide vaccine information and services* (**FGD Males 25+ years**)

Reasons for noncompliance to COVID-19 vaccines

The low uptake of the COVID-19 vaccine is partly attributed to people's beliefs and perceptions. The study's findings indicated that participants were not well informed about how the disease is transmitted and spread and had different perceptions and beliefs, which leaders influenced, as some leaders' statements came with confusion on vaccine issues.

> *Mmh, For the already infected individuals, we are afraid of vaccinating them for fear that they can become seriously sick. We are still learning about this disease; we are not sure how and where the disease came from.* (**KII Number 4*)***
>
> *The community was confused by the opinions of different leaders regarding COVID-19 vaccination. Hence, when you approach people, some are against the vaccine, and others are against it. They tell you, "Can't you see that our leader said the vaccine is not safe? How come you are saying it is safe now?" Our initial response to COVID-19 was not right, and now we pay the consequences—high vaccination refusal* **(KII Number 3).**

Some participants reported that proper vaccine information and education were not provided to people in the initial response to the pandemic. People are being informed and educated on the importance of the COVID-19 vaccine, and there is hope that positive changes will be achieved. Other

https://dx.doi.org/10.4314/thrb.v25i4.16

participants reported that vaccination hesitancy is due to family influence, and COVID-19 vaccination is treated as a secret issue. There have been reports by participants as indicated here:

> *Those who hesitate to be vaccinated do not have adequate and appropriate information on the vaccine. Continuously providing appropriate vaccine information will change the status quo. It is not easy, but people will eventually change their negative perspective on vaccines*
>
> *If they receive appropriate information, people have started to change; the difficult ones have become good ambassadors* ***(KII Number 1).***
>
> *I have not received vaccine information from the right people, so I am not vaccinated because I am unsure of the vaccine's safety. I am waiting for what will happen to those who have received the vaccine. You know the vaccination exercise is kept secret, and a family decides whether their relatives should be vaccinated. People do not want to be stigmatized for being vaccinated, so they prefer not to admit that they have been vaccinated openly.* (**FGD_Males 25+ Years)**

Effects of COVID-19 vaccination on delivery of other services

The findings from this study indicated that there is ambivalence regarding the effects of COVID-19 vaccination on the delivery of other services. Participants in this study indicated mixed perspectives. Some participants said that COVID-19 vaccination did not affect the delivery of other services as they were running as usual. According to the narration, others mentioned that COVID-19 vaccination activities added an extra load to already overworked health workers.

> *It does not harm anything [COVID-19 vaccination]. People continue with their usual activities. Some health workers continue their routine work, while others deliver the COVID-19 vaccine. Therefore, Kazi Inaendelea [the work continues]* ***(KII Number 4).***
>
> *COVID-19 vaccination did not affect the delivery of other health services. When we provide mobile clinics, we ensure that other services continue as usual at the health centre* ***(KII Number 3).***
>
> *You know, the COVID-19 vaccination was not included in the plan, so we are trying to fix its activities in our plan. We cannot afford not to implement COVID-19 vaccination activities; the disease is dangerous. But we cannot say that we have not been affected. Some planned activities were not implemented to accommodate COVID-19 vaccination activities* ***(KII Number 2).***
>
> *The same health workers were supposed to implement COVID-19 vaccination activities. That means health workers had to perform their routine duties and implement COVID-19 vaccination activities. Since there was pressure to reach vaccination targets, the focus was directed to COVID-19 vaccination, and thus, the time for other routine vaccines was consumed by COVID-19 vaccination. So, coupled with the shortage of human resources, you will realize that routine services were largely affected.* ***(KII Number 2).***

https://dx.doi.org/10.4314/thrb.v25i4.16

*I can say that COVID-19 vaccination has affected other routine services. As you increase the pace of providing the COVID-19 vaccine, you slow down or disrupt the provision of other routine services (***KII Number 6**).

Discussion

In this study, most participants were aware of COVID-19 and knew how it is transmitted. When asked about preventing the disease, they knew how to prevent it. Vaccine hesitance was also one of the issues among participants. Participants also mentioned the effect of the COVID-19 vaccine on other routine services.

Uptake of COVID-19 vaccine

Results indicate that study participants know COVID-19, its transmission and prevention. However, the uptake of vaccines for the prevention of COVID-19 is still low. In the Tanzanian context, the views of different leaders might have influenced community attitude and perception of the COVID-19 vaccine, consequently leading to low uptake. This is in line with the results of other studies which reported that uptake of COVID-19 vaccine is influenced by knowledge, attitude and perception towards the vaccination (Kabakama et al., 2022; Vasudevan et al., 2020)

Knowledge of COVID-19 Transmission

Participants in this study indicated that they know how the disease is transmitted. The frequently mentioned methods of disease transmission included droplets, contact with infected persons, such as shaking hands, being in congestions, such as churches, and touching contaminated objects. Local and international travel presented a high risk of COVID-19 transmission. For example, the first cases involved individuals who had returned from abroad.

Most people in Tanzania use public transport, so adherence to social distancing was difficult. Although international travel was reduced during the study, local and international travel by road continued. Interactions among fellow drivers and with other travellers, as well as customs and immigration officers, placed international truck drivers at an increased risk of contracting and transmitting the disease (Godbole et al., 2023; Kabakama et al., 2022; Metta et al., 2023; Mgongo et al., 2023).

COVID-19 vaccination hesitancy

Study participants attributed vaccine hesitance to controversial messages from leaders and influential people. The fear of being judged as not obeying the leaders placed individuals who wanted to be vaccinated in a very difficult position. Hence, many people decided to keep their vaccination status secret. The findings align with the WHO's three "C's" contributing to vaccination hesitancy: complacency, convenience, and confidence. (Galagali et al., 2022). Rates of vaccine hesitancy, as well as contributing factors, vary widely based on a person's location, background, and community. (Rodrigues et al., 2022; Vanderpool et al., 2023). Vaccine hesitance has been reported in other countries and is an important obstacle to the fight against COVID-19. (Dhama et al., 2021; Puri et al., 2020; Sialubanje et al., 2022).

Vaccine availability alone does not increase vaccine coverage if hesitancy and refusal rates are high due to mistrust, safety issues, and a lack of reliable information about COVID-19 vaccines. (Ali et al., 2024; Kricorian et al., 2022; Mashoto et al., 2024) . Whereas the frequently mentioned reason for low uptake of the COVID-19 vaccine among the study participants was leaders' controversial messages, other studies reported poor accessibility due to poor road connectivity,

https://dx.doi.org/10.4314/thrb.v25i4.16

which led to long hours of travel, and lack of transportation facilities were the barriers to vaccine uptake. (Babatope et al., 2023)(Ali et al., 2024). This implies that vaccine hesitation has different factors.

Prevention of COVID 19

Study participants mentioned wearing masks, covering their mouths with their elbows, hand washing with running water, using sanitizers, and vaccination as preventive measures to control the spread of COVID-19. This means study participants have good knowledge of the disease's prevention, which aligns with the findings of other studies. (Hager et al., 2020). However, knowing that vaccines help control the spread of disease may not necessarily translate into use.

Other factors play a significant role in one's decision to be vaccinated. COVID-19 vaccination exacerbated the existing human resource shortage, affecting the delivery of other routine health services. This study's findings are similar to those of the WHO regions and elsewhere. (Al-raeei, 2020; Paul et al., 2021).

Study strength

Purposive sampling of participants comprising health workers and community members with different demographic and socioeconomic characteristics (sex: male and female; age; place and province of residence: urban and rural settings) allows for comparing of participant views, which in turn provides an in-depth understanding of the subject under investigation. Using different data collection techniques (focus group discussions and in-depth interviews) and data sources allowed for triangulation of findings, which increased the study's internal validity.

Study limitations

Conducting the study at the beginning of the COVID-19 national mass vaccination, when the programme was still new in the country, may have affected the participants' views.

Conclusion

Awareness and knowledge on COVID-19 prevention and transmission are high among study participants, but vaccine uptake is low and influenced by highly ranked top leaders' controversial messages regarding vaccination. The Ministry of Health, under the communication section, should continue to reinforce the increasing awareness of COVID-19 and its means of transmission. The Ministry of Health should increase COVID-19 and provide means of transmission to top leaders. Furthermore, using community leaders and champions to deliver appropriate information on COVID-19 vaccination may help increase the uptake of the COVID-19 vaccine and prevent misconceptions among community members. To avoid disruption of delivery of other services, there is a need to strengthen the country's capacity for preparedness and response to emergencies and pandemics.

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Conflict of interest

The author declares no conflict of interest.

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