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Why I Have Not Taken the COVID-19 Vaccine" a Descriptive Qualitative Study of Older Adults' Perceived Views of COVID-19 Vaccine Uptake in Nigeria

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Abstract

Globally, the COVID-19 vaccine uptake is increasing, but slowly among older adults residing in lower and middle-income countries, including Nigeria. Following this, we explored the perceived views of older adults on the uptake of the COVID-19 vaccine in Nigeria. We adopted a qualitative descriptive study design and purposively selected and interviewed 16 retirees of older adults. Data were analyzed using conventional content analysis. Findings show that older adults' willingness to receive the COVID-19 vaccine was dissuaded by their past experiences with the government, religion, and Western media, including affordability and accessibility problems related to vaccination campaigns. Findings also show that the uncertainty about the COVID-19 virus existence and perceptions about COVID-19 vaccine risks influence older adults' decisions regarding vaccine uptake. Finally, older adults' views on getting vaccinated for COVID-19 were positively influenced by the trust they placed in their physicians and other members of their healthcare system. The government should incentivize healthcare workers to serve as a nudge to increase COVID-19 vaccine uptake among older adults in Nigeria.

Keywords COVID-19 · Older adults · Vaccination uptake · Nigeria

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Introduction

The emergence of the COVID-19 virus in late 2019 is a significant health threat, resulting in many deaths, especially among the older adult population. However, death from COVID-19 infection can be reduced if 60% to 80% of the world population has received at least two doses of the COVID-19 vaccine (Kalu et al., 2022). There is evidence of reduced death or spread of COVID-19 since the development of the COVID-19 vaccine. For instance, Moghadas and colleagues (2021) reported that COVID-19 vaccination reduced the overall attack rate from 9.0% to 4.6% over 300 days and that the highest relative reduction (54–62%) was observed among individuals aged 65 and older. Furthermore, COVID-19 vaccination has reduced other adverse outcomes, including a 65.6% and 69.3% reduction in intensive care unit hospitalization and death, respectively (Moghadas & colleagues, 2021). Despite the impact of COVID-19 vaccination on several outcomes, convincing the population to accept and take the vaccine has continued to be a significant setback in fighting the COVID-19 pandemic (Ritchie et al., 2021).

Vaccine uptake is defined as the absolute number of people who receive a specific vaccine dose(s) (Pan American Health Organization, 2020), and low uptake is increasingly recognized as a barrier to the success of vaccination programs globally (Piltch-Loeb & DiClemente, 2020). The introduction of a new vaccine to the public often faces hesitancy due to skepticism about its effectiveness and potential safety (Thunstrom et al., 2021). Vaccine hesitancy has existed throughout the history of medicine, and it is one of the major threats to public health globally. Vaccine hesitancy includes the delay of vaccine uptake, the unwillingness to be vaccinated, the act of getting only a part of the vaccines, and the refusal to continue (Afifi et al., 2021). Several factors have been reported in the literature to influence vaccine uptake and are summarized to include personal and environmental factors (Sallam, 2021; Lin et al., 2021; Cooper et al., 2021; Wake, 2021; Kalu et al., 2022). Public health policies related to the design of vaccination programs and media influence on the COVID-19 vaccination regarding efficiency and effectiveness are loosely grouped as environmental factors (Sallam, 2021; Kalu et al., 2022). Personal factors relate to previous historical experience regarding vaccination, perceived risk, and concerns over vaccine safety and effectiveness, religious belief, and socio-economic status (Cooper et al., 2021; Kalu et al., 2022).

The older adult populations are consistently placed on top of the list of those receiving the COVID-19 vaccine, mainly because they are vulnerable to COVID-19 infection and are more likely to die from the infection. For instance, adults over 65 represent 80% of hospitalization with COVID and have a 23-fold greater risk of death than those under 65 (Mueller et al., 2020). Immunosenescence, defined as a gradual decline in immune function, and having multiple chronic conditions, such as cardiovascular disease, diabetes, and hypertension, that are directly associated with the COVID-19 virus, could be the plausible reasons for the increased resultant effect of COVID-19 among older adults (Mueller et al., 2020). This highlights why older adults' perception of the vaccine is warranted.

Older adults' perception of the COVID-19 vaccine has been explored among older adults residing in the USA (Malani et al., 2020; Nikolovski et al., 2021) and Canada (Basta et al., 2022); European countries, such as Portugal (Silva et al., 2022), Germany (Malesza & Bozym, 2021); middle eastern countries, such as Saudi Arabia (Al-Hanawi et al., 2021) or Syria (Salibi et al., 2021); and Asia countries such as China (Siu et al., 2022; Chen et al. (2022), Hong Kong (Wang et al., 2022) and Thailand (Thanapluetiwong et al., 2021). A systematic review included 15 studies and reported that the prevalence of unwillingness to vaccinate against COVID-19 in older adults was 27.03% (95%CL: 15.10–38.95%) and that of those uncertain was 19.33% (95%Cl 12: 28–26:39). The risk of being unvaccinated was significantly higher among older adults with low education and low income (Veronese et al., 2021). The greater number of older adults with low education and income were older adults residing in developing regions, such as the Sub-Saharan region of Africa. However, no studies from SSA were among the 15 studies included in Veronese et al.'s review. The lack of studies that have explored COVID-19 vaccine perception from the perspective of older adults in Africa is not entirely surprising because reviews (Kalu et al., 2022; Cooper et al., 2021; Wake, 2021) that explored COVID-19 uptake in Africa reported that no studies have explicitly focused on the older adult population. This gap in the literature highlights the need to explore the perception of older adults regarding the COVID-19 vaccine in the African region.

Nigeria, the most populous nation in the SSA region and projected to be among the countries with the highest number of older adults, positioned the country as a starting point to understand older adults' perception of COVID-19. Besides, Nigeria's number of older adults that have received either single or double doses of the COVID-19 vaccine is low (Nigeria Center for Disease Control, 2022), highlighting the need to explore older adults' perception of COVID-19 to understand or find a solution to increase uptake. To the best of our knowledge, no study has explored the perception of the COVID-19 vaccine among older adults in Nigeria, either quantitative or qualitative. Studies that explored COVID-19 vaccine uptake perceptions and associated factors in Nigeria mainly focused on the general population (Iliyasu et al., 2021; Olu-Abiodun et al., 2022; Adedeji-Adenola et al., 2022; Chutiyami et al., 2022), and are often cross-sectional studies, which is limiting in understanding contextual reasons for vaccine uptake or hesitancy.

In par with the global literature and some other cultural reasons and inherent problems associated with vaccine uptake and distribution in developing countries, such as Nigeria, it is paramount to provide evidence on the perception of older adults in COVID-19 vaccine uptake. We believe that findings from this study would provide a different perspective to the existing literature on COVID-19 vaccine uptake among older adults and could provide contextual solutions to improve uptake in developing countries similar to Nigeria. Therefore, this study aimed to qualitatively explore older adults' perceived views on the COVID-19 vaccine uptake in Nigeria.

Materials and Methods

Study Design

Qualitative description research design (Sandelowski, 2000) guided sampling, data collection, and analyses for this study. This design facilitates the description and exploration of phenomena that capture the naturalistic perspectives of the participants (Sandelowski, 2000). Specifically, this design allowed us to describe the Nigerian older adults' views on vaccine uptake. We utilized semi-structured individual interviews to collect data from older adults. Ethical clearance was obtained from the Research Ethics Review Board of the primary author's institution [name withheld for blinding purposes]. Only participants who provided informed consent were allowed to participate in the study. We followed Consolidated Criteria for Reporting Qualitative Studies (Tong et al., 2007).

Study Setting, Sampling, and Recruitment

We conducted this study in Anambra state, Southeast Nigeria. The population of Anambra State is estimated at 4,177,828 (National Population Commission [NPC], 2006), and it is known to have a high number of older adults residing in both urban and rural communities (NPC, 2006). The population of older adults in Anambra state and the proximity to the researchers informed the study setting. Retirees in Anambra state are impoverished as their gratuity is paid infrequently (Premium Times, 2022). Like most Southeastern states, the people of Anambra are deeply political and religious (Meribe, 2019). We utilized purposive and snowball sampling techniques to recruit participants while applying age and gender sensitivity in the selection to ensure a gender-balanced view. Participants were recruited through study announcements on notice boards in local recreational centers, hospitals, and public places of worship, and interested persons contacted the authors. We employed criterion-based purposive sampling in selecting our participants. We included older adults who are 60 years or older, able to consent and communicate in English or Igbo and reside in the Anambra state. We estimated that a sample size of 16 (see Table 2) would lead to data saturation, and it is within the recommended sample size for a qualitative descriptive study design (Sandelowski, 2000). Through snowballing, participants provided contacts of other persons who met the eligibility criteria for participation, and we continued to contact participants until we reached data saturation.

Data Collection

Each participant was invited to a single, in-depth semi-structured telephone interview. Two trained qualitative researchers (Anthony Obinna Iwuagwu, Christopher Ndubuisi Ngwu) who understood English and Igbo languages conducted the interview. They created rapport with the respondents via the telephone before the interviews. The aim of building the rapport between

interviewers and participants was for two purposes: (a) to create mutual attentiveness that motivates participants to continue the interaction, and (b) to improve data quality as participants were encouraged to provide a comprehensive account of their experience regarding COVID-19 vaccine uptake. The interviewers consciously and reflectively ensured that their rapport with participants did not lead participants to give socially desirable answers by constantly reminding them that the research was conducted "with them" and "not on them" and that the purpose was to use the information they provide to inform policies on how to improve COVID-19 vaccine uptake. This approach delimits the power relations that often facilitate socially desirable responses (Weller, 2019). A participant information sheet containing study objectives, the risk, and the benefits of participation was read to the participants. Other ethical issues like confidentiality, anonymity, and participants' right to withdraw from the study without any reason were made known to the participants. We sought participants' consent to participate in the study and recorded their views.

Twenty older adults indicated an interest in participating; however, 17 met the inclusion criteria and consented to participate in the study. One older adult dropped out because of scheduling issues. All participants were interviewed using a semi-structured interview guide (both in English and Igbo languages) with probing questions. We translated the interview guide into the Igbo language with experts fluent in both languages. Examples of topic areas guiding questions we asked older adults include (a) if they would take the COVID-19 vaccine, and specific factors that could facilitate or act as barriers to vaccine uptake, and (b) suggestions on what can be done to change their minds to take the vaccine. Throughout the interviews, we probed participants based on their responses. While probing, we asked participants to describe instances or scenarios to buttress any major points raised. Participants were given the option to be interviewed in either English or Igbo. Older adults were interviewed in either Igbo (n = 7) or English (n = 9) languages. Interviewing participants in their native language has been recommended, as it allows researchers to explore salient issues by drawing out meaning or experiences from participants (Smith et al., 2008). Prior, we conducted a pilot telephone interview with two older adults to reflect the sensitivity of the questions to be asked and the time to allot to each interview (their data was not included in this study). Each interview lasted for 35–40 minutes.

Transcript Translation and Data Analysis

Data analysis occurred concurrently with data collection, allowing us to achieve data sufficiency (Saunders et al., 2018). Recorded interviews were transcribed verbatim. We employed two expert translators in the Igbo and English languages. They independently translated the interviews conducted in the Igbo language to English; both met and discussed their translation. In two research meetings, discrepancies were resolved, with the two expert translators and three authors (Authors 1, 3, 4) speaking both English and Igbo. Conventional content analysis was utilized (Hsieh & Shannon, 2005). Firstly, we defined the units of analysis - sentences on COVID-19 vaccine uptake from older adults' perspectives. Secondly, three coders (Authors 1, 2, 4) read the transcripts line by line to generate initial codes and discuss the coding book

to identify themes. Thirdly a working draft coding book was developed, and we also defined different units of analysis and applied them as we continued data collection and analysis. Although we had a working draft coding book, three coders continued to code line by line so that the original views of the respondents would not be lost. See Appendix for the coding sampling. We used code numbers [001, 002, to 016] to ensure the anonymity of participants in analyzing and reporting data. We employed the NVivo software to manage our qualitative analysis.

Strategies to Ensure Trustworthiness

We employed several strategies to ensure rigor (Lincoln & Guba, 1985). First, we conducted peer member checking - where all authors had to discuss the themes and share their thoughts. We kept reflective and observation notes (field notes) throughout the research process. Our reflective notes described our "Subjective I"- those values, assumptions, and beliefs that a qualitative researcher brings to the research. At the beginning of our study, all authors explicitly stated their assumptions. Authors 1 and 3 were gerontological social workers, author 2 is a research methodologist with a background in health sciences, while author 4 is a gerontologist with a background in physiotherapy. Authors 1 and 3 interviewed the participants and Authors 1, 2, 4 conducted data analysis; they constantly reflected on how being advocates for social workers' professional growth and recognition in Nigeria (Subjective I's) could have influenced the data analysis. In some cases, Author 3 was invited to review the data analysis to align with the study aims.

Results

Sixteen older adults participated in the study (Table 1). The mean (SD) age of older adults was 67.8 (2.8) years, and 50% ($n=8$) were female. All older adults were retired, and 68.8% ($n=11$) held a bachelor's degree or higher.

Themes and Subthemes

Three themes emerged from the participants' interview "previous and current failures of the system," "the daunting leap of faith," and "the trust and faith in the healthcare system." These themes are progressive, from factors pulling older adults away from taking the COVID-19 vaccine to factors pushing them toward taking the COVID-19 vaccine (See Fig. 1). Together, these themes showed a varied perception of older adults regarding COVID-19. While some participants stated that they would not take the vaccine because of the previous/current system failures, including distrust towards the systems in Nigeria and relating to the lack of affordability and accessibility of the previous vaccines in Nigeria, others reminiscence of the positive past experiences of vaccination and their faith in doctors as the reasons they would take the vaccine. We identify a theme, the daunting

Table 1 Demographic characteristics of Respondents

Code	Gender	Age	Occupation	Lev. of Education
001	Male	67	Retiree	Degree
002	Male	66	Retiree	Degree
003	Female	69	Retiree	WASSCE
004	Male	65	Retiree	Degree
005	Female	65	Retiree	Degree
006	Female	69	Retiree	Degree
007	Female	68	Retiree	Degree
008	Male	75	Retiree	WASSCE
009	Female	70	Retiree	Degree
010	Male	65	Retiree	Degree
011	Male	68	Retiree	WASSCE
012	Female	71	Retiree	Degree
013	Female	67	Retiree	WASSCE
014	Female	69	Retiree	Degree
015	Male	65	Retiree	WASSCE
016	Male	65	Retiree	Degree

Lev. of Education: The highest level of education

WASSCE: West African senior secondary certificate examination

Degree: Bachelor's degree or any other higher certificate obtained

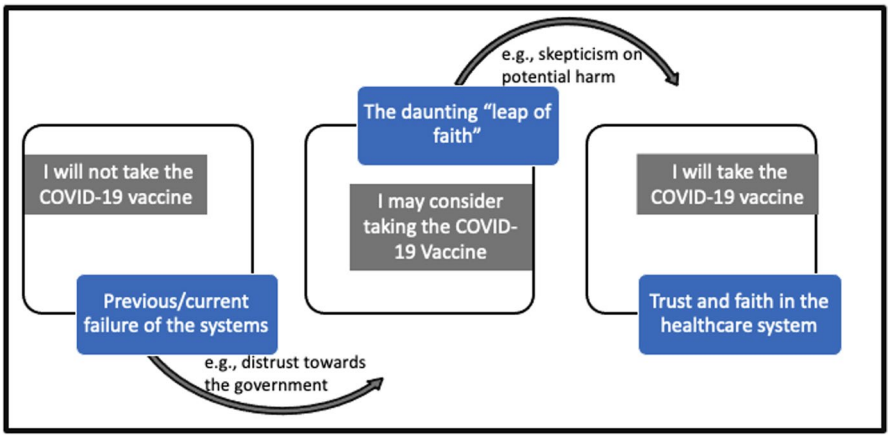

Fig. 1 The themes that emerged as older adults' perception of COVID-19 vaccination. Three themes illustrated progressive factors highlighting reasons regarding if older adults will, may consider, or will not take the COVID-19 vaccine

"leap of faith," encompassing the uncertainty of the risk of COVID-19 would hinder their acceptance of COVID-19; however, they would take a leap of faith in taking the COVID-19 vaccine only when it is critical. Overall, participants'

perceived view of the COVID-19 vaccine uptake is influenced by their experience related to previous vaccination programs in Nigeria.

Theme 1: Previous and Current Failures of the System

This theme portrayed how older adults' willingness to receive the COVID-19 vaccine was dissuaded by their past experiences with the government, religion, and Western media, as well as their perceived issues with the current COVID-19 vaccination rollout in Nigeria. This theme was derived from two subthemes: distrust towards the system in Nigeria and the affordability and accessibility problems related to COVID-19 vaccination.

Distrust towards the "Systems"

As described by the participants, the "systems" encompass doubts over COVID-19 existence, the government's responses to COVID-19, and the influence of western politics and media on the COVID-19 pandemic. The distrust of these systems acted as a factor that pushed older adults away from taking the vaccine. Notably, several participants underscored their perception regarding COVID-19 as a hoax created by foreign nations, and the Nigerian government has taken advantage of it to enrich themselves as the reasons for not accepting or taking the COVID-19 vaccine. Participants felt that the Nigerian government played along with the COVID-19 outbreak strategies, including physical distancing and lockdowns, to attract foreign aid [005]. Ultimately, this distrust towards the systems is deeply rooted in the mistrust of westerners based on previous experience with colonial history and strategies to reduce the population in the African Nations. The influence of western politics and conflicting information from media houses further heightened their undesirability to be vaccinated against COVID-19. Most importantly, the media's adverse report of the COVID-19 vaccine effect and the continuous spread of the COVID-19 virus among those who have taken the vaccine further heightened their desire not to be vaccinated.

> *I strongly doubt if there is anything like COVID-19 in Nigeria ... To date, I still have some doubt if the virus exists at all, and I would not expose myself to a vaccine unless I am convinced otherwise of the existence [003].*
> *No, I will not take the vaccine …if I don't believe the COVID-19 virus exists, why then should I take the vaccine? [001].*

The doubt over the existence of the COVID-19 virus is circumstantial, as participants believed that there are more important things to care about than the perceived COVID-19 virus; hence, they would not take any vaccine.

> *Is there anything like COVID-19 in Nigeria? My learned [educated] friend whom I spoke with over the phone told me that ... the numbers of deaths we continue to get from NCDC [Nigeria Centre for Disease Control] are deaths caused by other illnesses, maybe hunger. To date, I still have some doubt if the*

virus exists at all, and I would not expose myself to a vaccine unless I am convinced otherwise of its existence [003].

Older adults' inherent desire to obey religious leaders and their beliefs contributed to their lack of interest in receiving COVID-19 vaccination. Older adults believed their religious faith in God would protect them from COVID-19 because "COVID-19 virus is not from God as God will not allow an evil virus to attack his children [005]." Building on this, older adults reflected and believed that during a previous outbreak such as Ebola, people who contracted it were cured by God; hence God will also cure this one [002]. As a result, they would not be able to take the vaccine.

Participants highlighted that most political and religious leaders advised them not to take the vaccine because they [the leaders] do not trust the western world. One participant cited that President Trump, the US president stated that we did not need the vaccine.... [005], highlighting the perceived impact of leadership on COVID-19 vaccine uptake even in developing regions of the world. The idea of political and religious leaders' influence on the COVID-19 vaccine was found to be based on previous vaccination, such as polio vaccination.

The religious and political leaders in Kano, Zamfara, especially the Supreme Court of Sharia leaders, advised us not to vaccinate our children when we had a polio outbreak. They all warned against the uptake as they believed the vaccine was corrupt and the producers (westerners) had ulterior motives [002].

Affordability and Accessibility Problems Related to COVID-19 Vaccination

Affordability and accessibility based on previous vaccination in Nigeria fueled older adults' distrust in the government, further compounding their lack of interest in COVID-19 vaccination. Older adults defined *affordability* as the ability to pay for transportation to travel to the COVID-19 vaccination center and conceptualized *accessibility* as distance to the vaccination center. Older adults generally reside in rural areas in Nigeria, and they highlighted that the far distance of the COVID-19 vaccination center and the lack of finance or help to transport themselves to the vaccination center influenced their desire to be vaccinated. They believed that they would not have high hopes that government would subsidize transportation or bring the vaccine to them in the rural area.

We live in rural areas, so they [the government] do not even bring vaccines—take, for instance, the polio vaccine; we traveled far to get a doze. Some of us did not have the money to do the travel... they [the government] will repeat the same accessibility issues, as history repeats itself [014].

Regardless, our participants reiterated that the government should emulate the previous strategy (door-to-door) to enhance vaccination, which could make them change their minds about vaccination. The participants highlighted that emulating the previous strategy will help solve the problem of accessibility, especially for older adults with mobility problems, and will invariably eliminate the

affordability problem for all older adult population, serving as a motivator to receiving COVID-19 vaccination.

> *If the government would emulate the house-to-house (Door-to-Door) strategy adopted during polio vaccination, I think older adults- especially those with the disability of mobility, would easily avail themselves to be vaccinated. You don't expect an older person in a wheelchair to go through so much stress locating vaccination centers … [016].*

In Nigeria, older adults were not listed as a priority group (Kalu et al., 2022) but were placed as the second group receiving COVID-19 vaccination after the healthcare workers received it in the first batch. Because of this, older adults see this process as a failure as the government did not prioritize the older adults with chronic conditions, who are more likely to contract the infection and die from the infections. This assertion further affirms their distrust of the government, highlighting their hesitation to take the vaccine....

> *People of my age grade are not receiving the vaccine yet. They say we will start getting it in the second phase…why would they do that? Most older people have so many diseases that would make them sick and die when they contact this virus, this makes me to question if this virus really exists and if the government does not give older adults first [015].*

Theme 2: The Daunting "leap of faith"

This theme captured older adults' belief in the uncertainty of COVID-19 virus that capsulate their perceptions that COVID-19 vaccine risks appear to outweigh the benefits, highlighting that vaccination is only needed when the situation is critical. Regardless, older adults' decision to take the vaccine "or not" is largely influenced by their trust and safety of the COVID-19 vaccine, as described by their peers.

Risks Appear to Outweigh the Benefits

The potential harms believed by the older adults influenced whether they would take the COVID-19 vaccine or not. Participants were concerned about the potential side effects of the vaccine, or that the COVID-19 vaccine would cause their poor health to worsen even further. For instance, [003] participant stated that he will *not take the vaccine, as he believed that the vaccine might worsen his health conditions.*

The belief that the COVID-19 vaccine will worsen the health conditions of older adults has further pushed our participants away from taking the COVID-19 vaccine. More so, the inherent desire to see or meet an older adult who has received the COVID-19 vaccine and inquire about the effect on their health could either "push them away from" or "pull them towards" taking the COVID-19 virus.

If you know an older adult who has taken the vaccine, I will like to ask the person about the side effect. Until then, I do not think I am ready for the complications of the COVID-19 vaccine [007].

Our participants talked about their family members' experiences or feelings after receiving the COVID-19 vaccine, influencing whether they will take or not the vaccine. Older adults are more convince not to take the vaccine if a family member reports any feeling of unwell after taking the vaccine. Ultimately, this idea highlights the influence of family members on older adults' vaccination - a central and desirable approach to increasing vaccination in the aging population.

My son, who lives in the city, told me he took the vaccine and felt like something was wrong with his body system for some days. I was scared for him while it lasted and even more scared for myself and other older adults who might be forced to vaccinate when it gets to our turn [015].

Vaccination Is Only Needed when Things Are Critical

Older adults' willingness to get vaccinated was also greatly influenced by their belief that vaccines were only necessary when the pandemic was critical. As the spread of the COVID-19 virus has reduced, participants believed that taking the vaccine is redundant. Participants further reiterated that because previous pandemics, such as Ebola, were not resolved with a vaccination, mandating the COVID-19 vaccine is unnecessary.

During the Ebola Virus Disease in 2014, ... I do not think anyone I know got vaccinated. In 2015, I heard they wanted to produce a vaccine for Ebola virus prevention, but I never got vaccinated and have never been vaccinated as an adult because of the virus outbreak [008].

Similarly, participants believed that COVID-19 vaccination efforts were not needed in Nigeria because they had other preventative medicines, such as chloroquine. Older adults thought chloroquine, used to fight against malaria, provided additional immunity to COVID-19. This sentiment affirms the belief that the long-term effect of some drugs, such as chloroquine, could be the reason why COVID-19 infection is low in Nigeria, as they have not met or know someone who has contracted the COVID-19 infection.

We do not need a new vaccine because some old drugs like 'Chloroquine' may cure COVID-19 … In Nigeria, we have taken many [doses of] Chloroquine because of malaria, so taking a new vaccine is unnecessary [005].

The perceived curative nature of some drugs, such as chloroquine on COVID-19 virus was further strengthened when prominent politicians, such as the 45th president of the United States, Donald Trump, suggested that chloroquine can cure COVID-19.

We do not need a new vaccine because some old drugs like 'Chloroquine' may cure COVID-19, Trump- the US president even said that [005].

Trust and Safety in the Familiar

This subtheme captures that the vaccine uptake of older Nigerians was also influenced by their reliance on and trust in peers, and family members. Some older adults were dissuaded from getting vaccinated because they did not know any older adults who had received it. ... *I can't say that I know any older person who took the vaccine ... [007].*

Meanwhile, other participants received information and advice from their peers which downplayed the necessity of getting vaccinated, such as the belief that Black people are immune to COVID-19 and that the number of COVID-related deaths reported by the Nigerian government are over-reported.

My learned [educated] friend whom I spoke with over the phone told me that the virus does not affect black people and that the number of deaths we continue to get from NCDC [Nigeria Centre for Disease Control] are deaths caused by other illnesses, maybe hunger [003].
Some of my friends believed that even if it (COVID-19) exists, black men have resistance to it; therefore, it cannot affect Nigerians… [005].

Older Nigerians also preferred alternative treatments that they were familiar with over the COVID-19 vaccine, such as chloroquine or traditional medicines.

Ever since, I do not engage in vaccination. I have rather used herbal medication for any ailment [006].
During the Ebola Virus Disease in 2014, people applied different prevention methods such as bathing with salt water very early in the morning, among others, but I do not think anyone I know got vaccinated ... Using traditional medicines has proven effective in curing any ailment since our history as humans [008].

Theme 3: Trust and Faith in the Healthcare System

This theme highlighted how older adults' views on getting vaccinated for COVID-19 were positively influenced by the trust they placed in their physicians and other members of their healthcare system. Two subthemes were used to build this theme: positive past experiences with vaccines and the healthcare system and appealing to authority.

Positive Past Experiences with Vaccines and the Healthcare System

The fact that some older adults are willing to take the COVID-19 vaccine based on their previous knowledge regarding the benefits of vaccination, such as polio,

is promising to increase uptake. For instance, one older adult reiterated that among all her children, only her last child received the polio vaccine and that he (the last child) remained healthy throughout childhood compared to my seven other children who did not vaccinate [009]. This positive experience has been foundational to some older adults' profound interest in receiving COVID-19.

> *… since then, I have had this reasonable belief about vaccines, and this experience will make me willing to take the COVID-19 vaccine when it is available to us [009].*

While some participants in our study perceived that the COVID-19 virus is not confirmed in Nigeria, our analysis reveals a diverging opinion. We noticed that participants who believed that COVID-19 existed were individuals who had been infected with the COVID-19 virus or knew someone who had been infected. Older adults' desire to take the vaccine was further fueled by their experiences of the severity of the COVID-19 virus symptoms, including death.

> *COVID-19 is real… I strongly believe it exists in Nigeria… I know about 3 friends and a brother who contracted the virus even though they never traveled outside the country. Even though my friends recovered, my brother could not make it… Yes, he died of COVID-19 complications... [010].*

Appealing to Authority

Older adults respect and listen to their healthcare workers, including physicians and nurses in Nigeria. It is no surprise that our participants stated that even though they do not believe that the COVID-19 virus exists, they will take the vaccine if their physicians or nurses advise them. This notion is built from the idea that they value and respect their physicians' knowledge and expertise. And over time, they have built trust and rapport with their physician, believing their physician understands their health conditions and would not advise them to take something that will worsen their health.

> *...while I may have my reservations, I would listen to my doctors if they could clearly explain the need for vaccination and assure me there would be no complications. I have always trusted my family doctors, so I cannot start now to do otherwise because they … have performed very well in managing my medical history... [005].*

Some older adults highlighted that they might consider taking the COVID-19 vaccine, as it is the gateway for them to continue receiving healthcare services for their other medical issues. This notion stems from the previous experience that, in the past, they had to comply with other COVID-19 safety procedures (e.g., mask-wearing, sanitization) for their physicians to visit their homes. The participants believed that, at some time, COVID-19 vaccination would be the only condition to receive care in Nigeria. Therefore, they are conditioning their mind to take the vaccine.

If my doctor insists that I take the vaccine before receiving medical attention, I will do so, even though reluctantly. I want to continue getting treatment for my other health issues, which need constant checkups …while I was not too fond of the use of face mask, my doctors warned that if I wouldn't use the mask … they wouldn't come to my house to check up on my condition… I had to comply with having them visit and treat me. Therefore, I don't think vaccination will be any different; I will comply if any doctors insist [015].

Discussion

This study presents unique emergent themes describing older adults' perceived views on the COVID-19 vaccine uptake in Nigeria. The three themes that emerged were conceptualized as: "I will not take the COVID-19 vaccine" because of the older adults' previous experience in the systems, including the government; "I may consider taking the COVID-19 vaccine" only when it is COVID-19 pandemic is 'critical' and "I will take the COVID-19 vaccine" because I know someone that died following COVID-19 virus infection. These themes showed a progressive perspective demonstrating factors that could increase and hinder COVID-19 vaccine uptake in Nigeria. To our knowledge, this is the first study to describe the unique perception of Nigerian older adults on COVID-19 uptake. This study's findings will enable us to understand what and how to improve COVID-19 vaccine uptake, as it is currently low in Nigeria, especially among older adults. This study is the first approach to developing culturally-focused interventions to enhance the COVID-19 vaccine in a low-resource setting, such as Nigeria.

Our study revealed that previous vaccination experiences influenced older adults' decision to take or not take the COVID-19 vaccine. These previous experiences were mainly barriers. For instance, older adults experienced the Nigerian vaccination boycott in 2003, a famous event led by political leaders, contributing to polio immunization vaccination hesitancy in Northern Nigeria. Their reflection on this event plays a role in their decision to take the COVID-19 vaccine and highlights the impact of historical events on vaccination uptakes. During the Nigerian vaccination boycott in 2003, religious and political leaders advised the populace to avoid taking the polio vaccine because they suspected it might contain anti-fertility agents (estradiol hormone), HIV, and cancerous agents (Ghinai et al., 2013). Although there is no evidence of disapproval from religious leaders on COVID-19 vaccines, religious leaders have constantly made comments that could instigate distrust of the COVID-19 vaccine (Ferrier, 2021), influencing older adults' decisions to receive the COVID-19 vaccine or not. Nigerians are very religious, and as a result, they obey religious leaders, including pastors and Imams, and are most likely to listen to and obey any instruction regarding the COVID-19 vaccine from them (Okoye & Obulor, 2021). Therefore, to improve

COVID-19 vaccine uptake among older adults, empowering religious leaders via educating them on the importance of achieving a "vaccine herd" should be the government priority in Nigeria and lower and middle-income countries with similar historical-religious influences. We also advocate that it is high time the Nigerian government co-develop grass-root education processes with older adults with previous immunization history to re-educate the populace on the importance of vaccination. A component of debunking historical beliefs about the effect of vaccination, such as that vaccines reduce fertility, should be the first approach to re-educating.

The idea that herbal medicine could be an alternative to the COVID-19 vaccine perpetuates vaccine hesitancy among older adults. Although not in the Nigerian context, Matiashe (2021) reported that in some countries like Zimbabwe and Tanzania, individuals (older adults inclusive) have continued to take traditional herbal medicine, boycotting the available COVID-19 vaccine. This assertion highlights the importance people in lower and middle-income countries place on their traditional herbal medicine. Moreover, Ridgway (2020) reported that individuals in China and France had used anti-malaria drugs (e.g., Chloroquine and hydroxychloroquine) as alternatives to the COVID-19 vaccine. Therefore, it is plausible that older adults are waiting for an alternative to the COVID-19 vaccine, especially drugs they are familiar with.

Accessibility, defined as the cost of the COVID-19 vaccine and how far older adults must travel to get the vaccine, was another barrier identified by our participants. Access to health services is an ongoing global issue, mainly in developing regions, and has worsened during the COVID-19 pandemic. Although not among the older adult population, a recent study exploring the impact of COVID on health services in seven slums in Bangladesh, Kenya, Nigeria, and Pakistan reported a reduction in access to healthcare services (Ahmed et al., 2020). Similarly, Maddock and colleagues (Maddock et al., 2022) reported that older English adults (50+) could not access healthcare services during the early phases of the COVID-19 pandemic. Specifically, terms such as - inconvenient and limited clinic hours for immunization, inadequate access to health care, and vaccine administration fees were accessibility issues of previous vaccine uptake in the US (Anderson, 2014). Therefore, efforts to reduce this inaccessibility of vaccines should be several government priorities to achieve herd immunity in the world's developing regions.

While access to healthcare is an ongoing global discussion, our participants suggested a door-to-door vaccination campaign that could solve an aspect of COVID-19 vaccine accessibility - the time and cost of traveling to the vaccination center. The door-to-door approach to vaccination has been most Nigerians' preferred method of delivering vaccination (Ozawa et al., 2018). Recent studies have also recommended that door-to-door immunization is the most effective method of increasing vaccine uptake among floating refusers (those indifferent about vaccination) (Sato & Takasaki, 2021). This approach is promising as it will remove barriers (e.g., travel times to the clinic) and significantly improve access

to immunization services in hard-to-reach rural settings with the largest population of older adults; as supported by evidence from India and Kenya (Dutta et al., 2021; Shikuku et al., 2019). Financial resources and political interest could be relative factors hindering the implementation of door-to-door COVID-19 vaccination—another area of study to explore in the developing context.

Of note was the finding that older adults would take the COVID-19 vaccine if their trusted healthcare provider advised them. This finding highlights the importance of healthcare providers in increasing COVID-19 uptake in developing countries, such as Nigeria. Healthcare workers, especially physicians, in Nigeria are well respected and trusted mainly because of their medical expertise and knowledge. As a result, most healthcare workers exercise authority and power, leading to the general public believing and listening to them. Therefore, the government needs to train healthcare workers on the importance of the COVID-19 vaccine and incentivizes them to advise their patient/clients to take the COVID-19 vaccine. However surprising as it may sound, getting healthcare workers to advise their clients to take the COVID-19 vaccine has been problematic because some healthcare workers are also hesitant about getting it. A 2021 scoping review including 35 studies reported that the prevalence of COVID-19 vaccination hesitancy among healthcare workers globally ranged from 4.3% in China to 72% in Congo (Biswas et al., 2021). Similarly, Robinson et al. (2021) reported that less than half (49%) of sampled Nigerian healthcare workers were willing to get a COVID-19 vaccination. Concerns about the vaccine's safety, efficacy, and potential side effects were the primary reasons why some healthcare workers, especially those in developing regions, were hesitant to use the COVID-19 vaccine (Biswas et al., 2021). Therefore, the public health organization should rethink the best way to increase vaccine uptake among healthcare workers in developing countries, as they are most likely to increase the uptake among vulnerable populations, including older Nigerians.

Recommendations to increase vaccine uptake among older adults in Nigeria.

- Re-education strategies in plain language and accessible forms, such as infographics with pictures and real-life stories of those who contracted the COVID-19 virus and have taken the vaccine, would help add Nigeria's experiences to the discourse regarding COVID-19 vaccination. This approach is vital as most COVID-19 vaccination awareness pamphlets focus on statistics that older adults do not believe. Education materials should be targeted to debunk media information regarding the COVID-19 vaccine and replacing with factual experience information, such as personal stories of the benefits of COVID-19 and the associated side effects.
- Since older adults' respect and listen to religious leaders and their healthcare workers, strategies to encourage these groups of individuals to advise older adults to take the COVID-19 vaccine are needed. Such strategies should include organizing free and incentive workshop seminars in each geopolitical zone for

religious leaders to train them on the competencies or skills to provide informative advice to older adults and other groups regarding the importance of COVID-19 vaccination.

- As suggested by our participants, developing strategies like door-to-door COVID-19 immunization would help increase COVID-19 uptake, as it would solve the issue of affordability and accessibility of the COVID-19 vaccine.
- A cash incentive could be used to increase the COVID-19 vaccine among older adults in Nigeria. For instance, any older adults who received COVID-19 and convinced their friends to take the vaccine would be compensated for a fee, e.g., 2000 NGN (~5 USD) per friend invite who completed the COVID-19 two doses. This approach is promising to increase COVID-19 uptakes in Nigeria, as a randomized control trial reported that a cash reward of 24 USD, compared to several behavioral nudges, had the power to increase COVID-19 vaccination by 4% points in Sweden (Campos-Mercade et al., 2021). We believed this percentage would be higher in low-resource income countries like Nigeria.

Strengths and Limitations

While our study highlighted some factors that could hinder COVID-19 vaccine update among older adults in Nigeria, we acknowledge some limitations. The finding of this research reflects the views of a small subset of older adults in a Southeastern state in Nigeria. No viewpoints were heard from older adults in other localities (rural areas) who did not participate in the study. We, therefore, do not generalize our results to the broader population because with a bigger sample size from other regions, results may be different. Therefore, we recommend that future studies cover other areas to compare results. The strength of our study centers on our ability to engage strategies to ensure rigor, such as peer member checking, reflexivity throughout the research process, triple coding through data analysis, and our ability to provide detailed and thick descriptions of our study process for other researchers to replicate.

Conclusion

We noted previous experiences of vaccines and the COVID-19 perceptions as both barriers and facilitators to perceived vaccine uptake among older adults in Nigeria. Therefore, we recommend that the Nigerian government adopt the previous door-to-door approach during the second phase of vaccination in Nigeria, where older adults are prioritized for future vaccine uptake. Future studies should explore the impact of incentives (cash or non-cash) on COVID-19 vaccination among Nigerian, specifically older adults' population.

Appendix

Table 2 Example coding process

Units of Analysis	Codes	Categories	Subthemes	Themes
We live in the rural areas, so they [the government] do not even bring vaccines—take, for instance, the polio vaccine; we traveled a far distance to get a doze. Some of us did not have the money to do the travel…. they [government] will repeat the same accessibility issues, as history repeats itself [014].	No faith in Nigerian government	Distrust towards government	Distrust towards the "system" in Nigeria	Previous and current failures of the "system"
COVID-19, physical distancing, lockdown, and vaccination even are all hoaxes orchestrated by the Nigerian government to attract foreign aid… [005].				
We do not need a new vaccine because some old drugs like 'Chloroquine' may cure COVID-19, Trump- the US president even said that. In Nigeria, we have taken many [doses of] Chloroquine because of malaria, so taking a new vaccine is unnecessary [005].	Influence of Western media and politics	Influence of Western politics and media		
The religious and political leaders in Kano, Zamfara, especially the Supreme Court of Sharia leaders, advised us not to vaccinate our children when we had a polio outbreak. They all warned against the uptake as they believed the vaccine was corrupt and the producers (westerners) had ulterior motives [002].	Mistrust of westerners			
No, I will not take the vaccine …if I don't believe the COVID-19 virus exists, why then should I take the vaccine? That will mean I am contradicting myself and my beliefs..." [001].	Lack of belief in COVID-19	Doubt over COVID-19 existence and the government's responses		
COVID-19, physical distancing, lockdown, and vaccination even are all hoaxes orchestrated by the Nigerian government to attract foreign aid… [005].	Government uses COVID-19 to attract foreign aid and doubt in COVID existence			
We live in the rural areas, so they [the government] do not even bring vaccines—take, for instance, the polio vaccine; we traveled a far distance to get a doze. Some of us did not have the money to do the travel…. So, we don't care about this COVID-19 vaccine ... they [government] will repeat the same accessibility issues, as history repeats itself [014].	Location and financial restrictions on access	Affordability and accessibility of the vaccine	Affordability and accessibility problems related to COVID-19 vaccination	
If the government would emulate the house-to-house (Door-to-Door) strategy adopted during polio vaccination, I think older adults- especially those with the disability of mobility, would easily avail themselves to be vaccinated. You don't expect an older person in a wheelchair to go through so much stress locating vaccination centers … [016].	Lack of accessibility of vaccine			
... People of my age grade are not receiving the vaccine yet. They say we will start getting it in the second phase… [015].	Desires vaccination, but will receive in subsequent phase	Supportive of vaccination, but will receive in subsequent phase		
Yes, I would take the vaccine when it is my turn to do so; I eagerly anticipate the uptake so I can remain safe and not compromise the health of others around me [010].				

Data Availability All available data are in the manuscript.

Declarations

This article is original, has not been published previously or submitted elsewhere for consideration.

Conflict of Interest The authors declare no conflict of interest in this study.

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