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Original Article

Perceptions and hesitancy towards the COVID-19 vaccination campaign among three vulnerable populations in the Democratic Republic of the Congo: A qualitative study

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Abstract

Background: To deal with COVID-19, vaccination is a strategy adopted by many countries including the Democratic Republic of the Congo (DRC). The first phase of vaccination was conducted in 2021 as part of the country's Expanded Program on Immunization (EPI). To evaluate it, an intra-action review was conducted. It identified a low proportion of vaccinated vulnerable populations, namely health professionals (1.8%), chronically ill (0.09%), and older adults aged ≥ 55 (0.4%). The objective was to explore perceptions and barriers to acceptance of the COVID-19 vaccine in the DRC among the vulnerable populations targeted by the EPI.

Methodology: A qualitative study was conducted between September 2021 and June 2022 in Kinshasa, DRC. Semi-structured focus groups were conducted with each group separately using a single interview guide. It included five categories: socio-demographic information, COVID-19 vaccine status, perceptions towards the COVID-19 vaccination, vaccine hesitancy and perceptions towards the COVID-19 vaccination campaign.

Results: Three focus groups were conducted. In total, we had 16 participants with eight health professionals, four chronically ill participants, and four older adults. The majority were married (68.7%) and came from urban areas (68.7%). The sex ratio was at 1 and more than one-third had an education level equivalent to a master's degree (37.5%). Half were vaccinated against the COVID-19 (50.0%). The main perceptions and hesitancy factors were the lack of trust and knowledge of the vaccine's properties, benefits, and risks. Adjustment of the information messages which, according to participants, were not clear and poorly adapted to the needs of each group is the main element to improve the vaccination campaign.

Conclusion: This study represents an important step to improve the COVID-19 vaccination campaign in the DRC. It showed the different barriers to the COVID-19 vaccines acceptance among vulnerable populations.

Keywords: COVID-19, Vaccination Hesitancy, Vulnerable Populations, Africa

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Introduction

The Democratic Republic of the Congo (DRC) is in Central Africa. It is one of the poorest countries in the world and already faces many health challenges in addition to COVID-19 such as the Ebola virus disease (EVD) outbreaks and malaria which is endemic in the country. The DRC faced, like the rest of the world, several COVID-19 waves with the emergence of new variants. To deal with it, vaccination is a strategy adopted by most countries worldwide and the DRC was no exception [1–5]. The first phase of vaccination started on April 19, 2021. This vaccination campaign was part of the COVID-19 project of the Expanded Program on Immunization (EPI). This program aims to reduce morbidity and mortality from preventable target diseases through vaccination. More specifically, it is about ensuring better survival with the least risk of contracting preventable diseases [6]. To evaluate the first phase of vaccination in the campaign against COVID-19 implemented in the DRC, an intra-action review (IAR) was conducted from the end of July to early August 2021. According to the World Health Organization (WHO), COVID-19 IARs are conducted to support States in conducting periodic reviews of their national and subnational response to the COVID-19 pandemic with the aim of learning and improving their response [7][8] . The IAR conducted in the DRC identified several weaknesses, including the low adherence of the population, which led to the redeployment of a significant quantity of vaccine doses to other countries in the WHO-Afro region to avoid their expiry. Indeed, only 0.35% of the general population was vaccinated at the first dose and 0.01% at the second dose in 13 provinces out of the 26 in the DRC. In addition, the IAR of this first phase of the vaccination campaign highlighted the low vaccination coverage rate among people living with comorbidities, the refusal or hesitancy of some health professionals to be vaccinated, and the persistence of strong negative rumours about the COVID-19 vaccines. The IAR highlighted the urgency of updating the COVID-19 vaccination campaign in the DRC in implementing a new strategy to reach a greater number of people. Vulnerable populations are among the priority targets included in this new strategy. Indeed, low proportions of vaccinated persons were identified from the following three priority groups: health professionals (1.8%), people with chronic diseases (0.09%), and older adults aged ≥ 55 years old (0.4%) .

Following this IAR, the DRC Secretary-General for Health aimed to further investigate the factors likely to constitute barriers to the acceptance of COVID-19 vaccines among these three vulnerable populations. It is essential to understand their perceptions and hesitancy towards the COVID-19 vaccines as well as the perceptions towards the vaccination campaign set up by the EPI to pursue a second phase of vaccination more effectively throughout the DRC in the future [9,10].

The main objective was to explore the perceptions and barriers to the acceptance of COVID-19 vaccines in the DRC among the three priority vulnerable populations targeted by the EPI: health professionals, chronically ill participants, and older adults aged ≥ 55 years old.

Methods

Study design and participants.

A case study with a hypothetico-deductive qualitative method was conducted between September 2021 and June 2022 in Kinshasa, DRC.

A reasoned sampling was chosen to have diverse profiles based on different socio-demographic and occupational characteristics as well as different COVID-19 vaccination statuses. The common inclusion criteria for the three populations were: 1) being aged ≥18 years old, 2) living in Kinshasa, DRC 3) being fluent in French. Regarding the health professionals only, they had to be medical doctors or certified nurses. They were recruited by Medical Directors from the eight hospitals in Kinshasa. Half were men and the other half were women. For people with chronic conditions, they had to be diagnosed positive for HIV or for a chronic condition such as hypertension or diabetes in addition to being a non-health.

professional. They were invited to participate in the study at their health centers according to their medical records. Finally, the older adults included in the study had to be aged≥ 55 years old and not be health professionals.

Data collection

Semi-structured focus groups were conducted with each of the three populations separately using a unique interview guide. It was developed through a literature review. The interview guide included six categories which were: 1) socio-demographic information, 2) COVID-19 vaccination status, 3) perceptions of the COVID-19 vaccine, 4) COVID-19 vaccine hesitancy, 5) perceptions towards the COVID-19 vaccination campaign developed by the EPI, 6) suggestions to improve the COVID-19 vaccination campaign in the DRC.

(Table S I: Focus group interview guide used with the three priority populations in French language)
Data collection was done by two investigators: one was the moderator and the second was the timekeeper and observer. All focus groups were recorded.

Supplementary materials
Table S I: Focus group interview guide used with the three priority populations in the French language.

Themes	Questions	Comments
Introduction and General reminder Objective: To remind participants of the main theme to be addressed and to reassure participants for better adherence	Hello ladies and gentlemen, I am XXX, Public Health Specialist. Thank you for agreeing to participate in this group interview. Let me remind you of the general objective of the research and therefore of this interview: to explore and understand the perceptions and barriers to the acceptance of COVID-19 vaccines in the DRC among the priority groups targeted by the Expanded Programme on Immunization. At this stage, do you have any questions to ask about clarification?	Contextualizing the group interview
Instructions Objective: Clarify general guidelines; building trust; Obtain informed consent from participants in data collection and processing.	To begin with, I would like to remind you that for better treatment, the interview will be recorded via the dictaphone. It will then be transcribed. Do you agree? I would like to point out that the interview is anonymous, and the data will remain confidential. They will be destroyed after analysis. The questions are open-ended, so feel free to express yourself as you wish. There are no right or wrong answers. I also encourage kindness and respect for everyone during our exchange. I would also like to make it clear that the opinion of each of you is of great interest to us and will be of great value to our work. Everyone can answer every question asked. In addition, I would ask you to feel free to address any other topic that seems relevant to you. The estimated duration of the interview is approximately 45 to 60 minutes. Do you consent to participate in the study? We're going to start the interview and you're now registered.	Be as clear as possible to instil confidence in the participants.

Theme1: *Participant Profile*		
Objective; Draw up a general profile of the participants	As a preamble, I introduced myself. Could you now introduce yourself, please? *Age* *Living environment* *Level of education* *Profession* *Marital Status*	Brief Description
Theme2: *COVID-19 vaccination status* Objective; Understanding the motivations for COVID-19 vaccination and non-vaccination	Are there people in the group who have been vaccinated against COVID-19? *(For you what said "yes", how did you manage to do it?* *What convinced you? Individual motivations?, Motivations for the community?* - If I understand correctly, the others you haven't been vaccinated against COVID-19, right? *(For you what said "no", have you ever heard of COVID-19 vaccines? Is there a particular reason for the refusal???)*	
Theme 3: *Perception of COVID-19 vaccination* Objective: Have the interviewee's feelings or opinion on COVID-19 vaccination in general	For people who have been vaccinated against COVID-19, what is your impression (or feeling) about getting vaccinated after the fact*?* *(Are you satisfied? Indifferent? Regrets?)* For those who have not been vaccinated against COVID-19. Would you be willing, if the opportunity arises, to get vaccinated at this time? *(Why? Regrets? What for? Are you in favour? Cons? does it leave you indifferent?)*	

Theme4: Vaccine hesitancy	We just talked about who had been vaccinated against COVID-19 and who had not. But before you made your decision, did you hesitate? Was it difficult or rather easy to make your decision? What do you personally fear about COVID-19 vaccination? *In relation to the community?* *In relation to family and children?* *In relation to globalization, or as a citizen of the world?* *Fears? Risks* *The side effects.* *Confidence? Influence of pairs?* Do you think there are elements that make vaccination not necessary? Or can it be avoided? *Which?* *Are there any alternatives?*
Theme 5: Perception of the EPI COVID-19 vaccination campaign in the DRC	I would like us to turn now to the COVID-19 vaccination campaign that has been delivered by the Expanded Programme on Immunization. First of all, how did you find out about the COVID-19 vaccination in the DRC? *Have you seen a campaign (gathering of people)? A poster? Placard? A video? An audio message about vaccination?* *What impression(s) did it leave on you?* *Religious/Cultural/ Tribal/ Personal/ Political/ Other beliefs that discourage vaccine use?* *Do you think* the messages you receive are urging you to get vaccinated or to send people to get vaccinated? *Positive perceptions of the campaign, why?* *Negative perceptions of the campaign, why?* Finally, what do you think about the accessibility of COVID-19 vaccines in Kinshasa?

Theme 6: Suggestions related to the COVID-19 vaccination campaign		
	- I would now like to know if you had any suggestions to make to improve the COVID-19 vaccination campaign in the DRC? I'm talking to vaccinated people as well as the unvaccinated. *News* *Access* *Financing*	Bounce back on elements that have already been released beforehand during the interview if possible.
Fence Add the themes that may emerge from the interviewee's remarks; Announce the end of the interview.	Our group meeting is coming to an end, but before we close, is there anything anyone else that would like to add?	
After Interview	Thank you very much for your availability and your decision to participate voluntarily in this study. I remain at your disposal in case something comes back to you or if you would like to add something to complete your remarks. A written version of this interview will be sent to you shortly for you to validate. I'll leave you with my contact information as follows...	Keeping a door open

Data analysis

The interviews were transcribed and validated for accuracy by the participants. A thematic content analysis was performed manually. The transcripts were encrypted using digital codes to preserve the anonymity of each participant. Two different researchers independently did the coding phase and data extractions. All discrepancies were resolved by discussion and consensus among the researchers.

Ethical aspects

This study was conducted according to the guidelines of the Declaration of Helsinki. The objectives were explained to participants and voluntary informed consent was obtained from all of them. All information collected from participants was kept confidential.

Results

Focus groups.

Three focus groups with a 52-minute average duration were conducted with the three targeted populations. Thus, 16 people from Kinshasa, DRC, participated in the study with eight health professionals, four chronically ill participants, and four older adults.

Socio-demographic characteristics and COVID-19 vaccination status of participants

Most participants were married (68.7%), came from an urban area (68.7%), and were aged < 55 years old (62.5%). The sex ratio was 1 and more than a third had an education level equivalent to a master's degree (37.5%). Half of the participants were vaccinated against COVID-19 (50.0%).

Table I: Socio-demographic characteristics and COVID-19 vaccination status of participants

		Participants (N= 16)	
		Effective (n)	Percentage (%)
Gender	Female	8	50.0
	Male	8	50.0
Age (year)	23 – 54	10	62.5
	≥ 55	6	37.5
Marital status	Single	2	12.5
	Married	11	68.7
	Widow	3	18.7
Vaccination status	Vaccinated	8	50.0
	Unvaccinated	8	50.0
Education level	High school	2	12.5
	Medical doctor	4	25.0
	PhD	1	6.2
	Bachelor's degree	3	18.7
	Master's degree	6	37.5
Origin	Rural	5	31.2
	Urban	11	68.7

The socio-demographic characteristics of each group of participants are available in the additional materials.

(Table S II: Socio-demographic characteristics and COVID-19 vaccination status of health professionals;

		Participants (N= 8)	
		Effective (n)	Percentage (%)
Gender	Female	4	50.0
	Male	4	50.0
Age (year)	23 – 54	7	87.5
	≥ 55	1	12.5
Marital status	Single	1	12.5
	Married	6	75.0
	Widow	3	12.5
Vaccination status	Vaccinated	4	50.0
	Unvaccinated	4	50.0
Education level	Medical doctor	4	50.0
	Bachelor's degree	2	25.0
	Master's degree	2	25.0
Origin	Rural	2	25.0
	Urban	6	75.0

Table S III: Socio-demographic characteristics, COVID-19 vaccination status and chronic disease of the chronically ill participants.

		Participants (N= 4)	
		Effective (n)	Percentage (%)
Gender	Female	2	50.0
	Male	2	50.0
Age (year)	45 – 54	3	75.0
	55 – 59	0	0.0
	≥ 60	1	25.0
Marital status	Single	1	25.0
	Married	2	50.0
	Widow	1	25.0
Vaccination status	Vaccinated	2	50.0
	Unvaccinated	2	50.0
Education level	High school	1	25.0
	Bachelor's degree	1	25.0
	Master's degree	2	50.0
Origin	Rural	2	50.0
	Urban	2	50.0
Chronic disease	Type I diabetes	1	25.0
	High blood pressure	1	25.0
	HIV	2	50.0

Table S IV: Socio-demographic characteristics and COVID-19 vaccination status of the older adults)

		Participants (N= 4)	
		Effective (n)	Percentage (%)
Gender	Female	2	50.0
	Male	2	50.0
Age (year)	56 – 64	2	50.0
	65 – 74	1	25.0
	≥ 75	1	25.0
Marital status	Married	3	75.0
	Widow	1	25.0
Vaccination status	Vaccinated	2	50.0
	Unvaccinated	2	50.0
Education level	High school	1	25.0
	PhD	1	25.0
	Master's degree	2	50.0
Origin	Rural	1	25.0
	Urban	3	75.0

General perceptions towards the COVID-19 vaccines

Half of all our participants were in favour of the COVID-19 vaccines (50.0%). The main reasons were related to pragmatic reasoning such as placing one's trust in scientific data, the rarity of side effects, and the desire to return to a normal life with freedom of movement. Other elements in favour of the vaccines were related to a positive perception of the vaccine on the health status as they prevent worsening the health of people with chronic conditions or older adults. Also, it is a protection against severe forms of COVID-19 in case of infection and even a protection against death.

The elements against the COVID-19 vaccines cited by participants were mainly related to fears: fear of side effects, fear of having an immune system too weak to support the vaccine, and fear of worsening one's health condition by vaccination. Preference and confidence in traditional medicine was also a factor against the COVID-19 vaccines.

Table II: General perceptions towards the COVID-19 vaccines among vulnerable populations in the DRC

Positive perceptions	Negative perceptions	Verbatim
HEALTH PROFESSIONALS		
Trust in scientific data	Relapses number among vaccinated	*"I got vaccinated, I trust because it's approved by the WHO and the scientific community."*
Return to a normal life	Fear of side effects	*"I am in favour COVID-19 vaccine, especially since thanks to it, we are not only protected against severe forms but also we are free to move everywhere. It allows us to return to*

		a normal life."
Possibility to choose the vaccine type	Too rapid vaccine approval	*"I would be willing to get vaccinated only if the vaccine approval was not so rapid. For me, it can't take less than four years."*
CHRONICALLY ILL PARTICIPANTS		
Fear of developing a severe COVID-19 form	Weakness of the immune system due to chronic disease	*"Diabetes puts me at risk of developing multiple diseases, so I figured the vaccine would save me from having severe COVID-19."*
-	Fear of worsening one's health	*"Even if I had the chance, I wouldn't get vaccinated because I have enough problems with my health."*
OLDER ADULTS		
Fear of developing age-related complications if infected with COVID-19	Fear of side effects	*"My impressions of COVID-19 vaccination are positive. Getting vaccinated is a good thing to avoid severe forms at my age."*
The rarity of side effects	Too rapid vaccine approval	*"The COVID-19 vaccines in Kinshasa have so far not caused side effects."*
Fear of death if unvaccinated	Preference for traditional medicine	*"I think barrier gestures and herbal treatments like herbal steam baths may be enough."*

Vaccine hesitancy

In health professionals, vaccine hesitancy was mentioned 20 times during the focus group. The main hesitation factors were the lack of confidence in the vaccination program's sustainability and its positive impact on health, as well as the apprehension of potential discrimination against unvaccinated health professionals.

In people with chronic diseases, the topic of vaccine hesitancy was raised eight times during the focus group. The lack of confidence in COVID-19 vaccines with the main concerns of possible side effects and the lack of scientific research were cited as well as the deprivation of liberty in case of non-vaccination.
In the older adults, the topic of vaccine hesitancy was raised seven times during the focus group. The topic of vaccine hesitancy was raised seven times during the focus group. Lack of clarity in the communication campaign and lack of confidence in the scientific information were the sources of vaccine hesitancy.

Table III: COVID-19 vaccine hesitancy factors among vulnerable populations in the DRC

	Verbatim
Health professionals	
Lack of confidence in the sustainability of the vaccination program	*"My personal fears are that the current vaccination campaign has only served to calm the situation that led to the lockdown. In relation to the community, I fear that this renewed confidence gained at this moment will cease and lead to vaccine failure."*

Fear of long-term side effects and negative impacts on offspring	*"The only fear I have is that there will be negative consequences on the offspring."*
Coercive perception of the COVID-19 vaccination campaign	*"I do not approve of the loss of freedom with the vaccination status. Because of that vaccination may no longer be personal or voluntary."*
Apprehension of potential discrimination against unvaccinated health professionals	*"This kind of vaccine, against COVID-19 or another disease, could be grounds for job discrimination for health professionals."*
Preference for preventive measures other than vaccine	*"For now, prevention by doing regular testing and treating symptoms and boosting immunity can make a difference and is enough."*
Chronically ill participants	
Fear of side effects	*"I'm worried about long-term side effects."*
Lack of confidence in vaccine safety	*"As long as the studies have not yet clarified certain points, I prefer to limit myself to barrier gestures. »*
Deprivation of liberty for unvaccinated persons	*"The deprivation of free movement for the unvaccinated worries me."*
Older adults	
Lack of clarity when communicating scientific information and lack of trust in what is said	*"Some scientists on television say that collective vaccination is the basis for the emergence of new strains... It's not clear."*

Accessibility to COVID-19 vaccines

The perception of accessibility to COVID-19 vaccines was very positive in all our participants. In this regard, a health professional stated that:

"There is no problem with the accessibility of COVID-19 vaccines".

Also, a chronically ill participant said that:

"Vaccines are accessible through most public hospitals and some private ones to which the population can easily go to be vaccinated".

Finally, an older adult said:

"The vaccine is accessible to everyone."

However, another older adult raised the topic of inequalities in the accessibility to certain types of vaccines according to the beneficiaries' social profile:

"Some vaccines like AstraZeneca are more accessible to the poor and illiterate population while others that are supposedly more effective are accessible to the wealthiest persons".

Perceptions towards the COVID-19 vaccination campaign in the DRC and suggestions for its improvement

Perceptions towards the COVID-19 vaccination campaign were ambivalent with a tendency to dissatisfaction.

Free vaccination and simplicity of messages were two positive elements. A health professional said:

"It gave me a positive impression because it is adapted to the living standard in Kinshasa and because vaccines are supported by the government."

Another one said:

"For me, the impression was positive because the messages were easy to understand".
However, all three groups mentioned elements of dissatisfaction with the need for education and information about the vaccines' benefits and risks as also the vaccine trial phases. In this regard, one health professional said:
"For health professionals, you need to give more arguments than free vaccines, not having a serious form of the disease or the fact that it is a good quality vaccine ... more detail is needed."
A chronically ill participant also said:
"I think that the whole message needs to be redone: it is necessary to explain the benefits and risks in detail for health and for people who already suffer from chronic diseases. The benefits and risks associated with each case were not clear and, in this way, the message will be more convincing."

To improve the COVID-19 vaccination campaign, participants from each group provided several suggestions. While health professionals have rather presented the need for more evidence and field data around the benefits and side effects of vaccines, the chronically ill participants have expressed the need to clarify what are the risks and benefits of vaccines directly related to their chronic disease. Finally, the older adults expressed the need for education on the phases of vaccine trials as well as their benefits and side effects compared to traditional medicines.

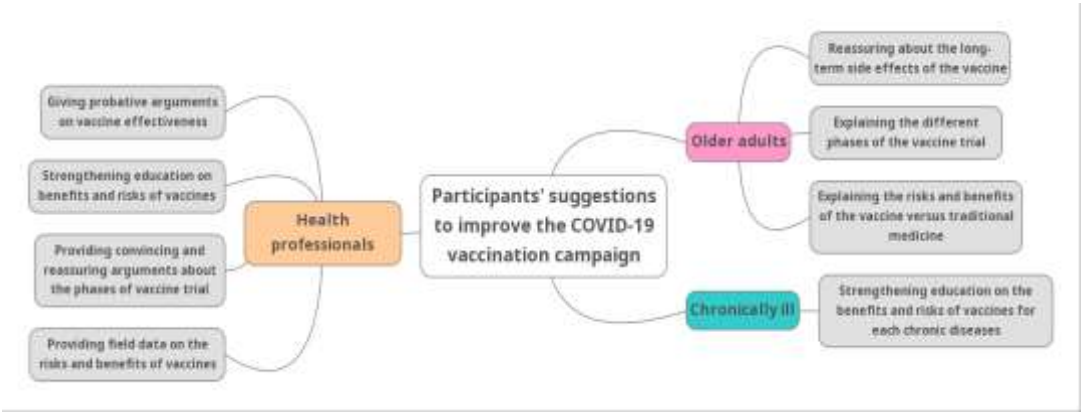

Figure 1: Mapping of the participants' suggestions to improve the COVID-19 vaccination campaign in the DRC

Discussion

The main objective was to explore the perceptions and barriers to the acceptance of COVID-19 vaccines in the DRC among the three priority vulnerable populations targeted by the EPI: health professionals, chronically ill participants, and older adults aged ≥ 55 years old. Sixteen people participated in the study with eight health professionals, four chronically ill participants, and four older adults.

Our results revealed an ambivalent perception towards the COVID-19 vaccines. Positive perceptions were related to confidence in scientific data, desire to return to normal life, and fear of developing a severe COVID-19 form with significant complications if not vaccinated. These results are in line with the literature as COVID-19 vaccines gave positive sentiments like safety, happiness, or confidence in science[9]. Negative perceptions were related to various fears such as side effects, infection despite vaccination, and vaccine safety. Fear of short and long-term side effects, coercive vaccination accompanied by lack of freedom, and lack of confidence in scientific data were the main factors in vaccine hesitancy. These findings are in line with a systematic review of vaccine acceptance worldwide.

where the DRC has one of the highest hesitancy rates worldwide [11]. Another systematic review and meta-analysis on COVID-19 vaccine acceptance among health professionals in Africa showed many similar elements than in this study. The side effects of the vaccine, its safety and efficacy, the duration of the clinical trials, and the little information given were the major reasons for COVID-19 hesitancy in the African region [12]. However, these barriers were found in the general population too in sub-Saharan Africa [13,14].

Regarding the COVID-19 vaccination campaign in the DRC, perceptions were rather negative. Free vaccines and their accessibility to vulnerable populations were two positive elements as, in the literature, it is suggested that accessibility for the most vulnerable population is one of the greatest challenges to having an effective COVID-19 vaccination campaign [15]. However, several elements were deplored. Thus, the lack of communication and education about the benefits and risks of vaccination according to the particular profiles of vulnerable populations as well as the safety aspects of vaccines were not taken into account in the campaign according to the participants. A study on the determinants of global vaccination campaigns to combat COVID-19 showed similar elements: side effects and vaccine trials were among the main preoccupations worldwide [16].

To improve the COVID-19 vaccination campaign in the DRC, our participants expressed several suggestions. Health professionals wanted probative and reassuring arguments on the phase of vaccine trial and its effectiveness, and more information on the benefits and risks of the vaccine. The chronically ill participants needed more education on the benefits and risks of the vaccine-related to their chronic diseases such as HIV, hypertension, or diabetes. The older adults wanted more information on the phases of the vaccine trial as well as the possible side effects. Also, they wanted to know the benefits and risks of the vaccine compared to traditional medicine. Similar suggestions have been reported in another study on the challenges to successful COVID-19 vaccination campaigns in Africa as concerns around vaccine safety and uncertainties were one of the main challenges [15].

Limitations and strengths of the study

The number of participants for each group was small. This is explained by the strong sensitivity of the theme in the DRC. Indeed, COVID-19 vaccines are relatively taboo in the DRC and generate many conflicts between people, even within close communities and families. Also, the design of the study does not allow the representativeness of the results on the entire general population.

This original study, which was the only one conducted in the DRC to assess the perceptions of the COVID-19 vaccines to our knowledge, included older adults. This is the main strength of the study as there is a paucity of studies related to COVID-19 and older adults in Africa [17]. Another strength is the design of the study. Indeed, the qualitative design provided an in-depth understanding of the elements that hindered the first phase of COVID-19 vaccination in the DRC. Also, the rigorous methodology adopted is a strength as well. As a matter of fact, the data collected were validated by the participants and the analysis was done by two researchers independently. These two elements are guarantees of scientific reliability. Finally, the transferability of our results is possible for other African countries like the DRC with the same socio-demographic characteristics, same health literacy level, and health systems as well as the double burden of communicable and non-communicable diseases to manage in addition to the COVID-19 such as the Congo-Brazzaville, Malawi and Angola [18].

Perspective and recommendations

This work represents a first step for improvement in the COVID-19 vaccination campaign in the DRC. A continuation of this work would be relevant to developing effective strategies to improve this campaign. In this sense and according to our results, we recommend the development of vaccine information

messages regarding efficacy, duration of immunization, and number of COVID-19 vaccine cases and deaths in the DRC [9,14];

The strengthening of education to vulnerable populations on the effects of COVID-19 vaccines is advocated to increase knowledge and remove apprehensions as well as misconceptions through robust and easy-to-understand scientific data as detecting and addressing hesitancy in subgroups is a key to improving vaccine campaigns [19];

The Modification of the current education and communication materials according to the types of vulnerable populations in providing strong scientific evidence for health professionals, explanatory and reassuring messages on the benefits and risks of vaccines according to the state of health for the chronically ill participants as well as the older adults is recommended. This is supported by the evidence from existing research which shows that, positive attitudes towards vaccination are induced by positive and adapted information [14,19,20];

The current positive elements of the vaccination campaign such as free vaccines and their ease of access should also be sustained [21].

Conclusion

This study represents a first step to improving the COVID-19 vaccination campaign in the DRC. It demonstrated that there are several barriers to acceptance of COVID-19 vaccines in the DRC among the three main vulnerable populations targeted by EPI. The lack of trust and knowledge around the properties, benefits, and risks of vaccines as well as the need to adjust information messages according to the needs of each population represent the main drivers of hesitancy of COVID-19 vaccines in the DRC.

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