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Appraisal of Public Opinions Towards Potential COVID-19 Vaccination in FCT-Abuja Nigeria

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ABSTRACT

The emergence of the novel Coronavirus Disease in 2019 (COVID-19) in Wuhan, China, and the subsequent global threat, resulting in the current pandemic in over 215 countries, characterized by alarming morbidity, mortality, and social effects in affected humans, as well as an economic downturn due to national and international border closures used as a containment strategy, necessitated this study to assess the opinions of the public on the potential vaccination against COVID-19. This research primarily aims to provide policy makers with useful information on public perceptions of the disease, as well as public knowledge and preparedness for its prevention and eventual eradication. Two hundred (200) organized open-ended questionnaires were distributed at random across the six (6) Area Councils in Abuja, Nigeria. The responses were subjected to the Pearson Chi-Square Test at a CI of 95 % and a level of significance of 5%. Of the 1200 respondents sampled, 976 (81.3%) were willing to be immunized if vaccines were available. However, 5 (0.4%) respondents expressed indifference, while 219 (18.3%) respondents did not support the use of COVID-19 vaccine for a variety of reasons, including a lack of confidence in the vaccine, belief in God for COVID-19 virus safety, and fear and dislike of injectable drugs. Thus, showing a vaccine response that was significantly affected by religion, marital status and education ($P < 0.05$). According to the results of the current study, respondents believe the novel Coronavirus has the potential to cause varying degrees of damage, eventually leading to death. However, their response revealed that vaccine acceptance could be hampered by distrust and other apprehensions. As a result, vaccinations must be implemented strategically and with enough publicity for the intent of enlightenment, empowering citizens to adopt the established intervention mechanism.

Keywords: COVID-19, Vaccination

Introduction

Coronaviruses are positive-sense, single-stranded RNA (ssRNA) viruses with genomes of 27–32 kb and spherical particles measuring 100–160 nm in diameter that belong to the Coronaviridae subfamily of the Coronaviridae family and order Nidovirales (ICTV) (Cui *et al.*, 2019).

Alphacoronavirus, Beta-coronavirus, Gamma-coronavirus, and Delta-coronavirus are the four genera that make up this subfamily (Graham *et al.*, 2013).

Alpha coronaviruses and Beta Coronaviruses only infect mammals, while Gamma Coronaviruses and

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Delta Coronaviruses mostly infect birds, but some can also infect mammals (Woo *et al.*, 2012). HKU1, NL63, OC43, 229E, SARS-CoV, MERS-CoV are the six (6) identified coronaviruses that have infected humans (Corman *et al.*, 2018), with SARS-CoV-2 being the seventh (Zhou *et al.*, 2020). SARS-CoV-2, SARS-CoV-1, and MERS coronaviruses are all members of the Beta coronavirus family and have been linked to serious illness, while HCoV-OC43, NL63, 229E, and HCoV-HKU1 have been linked to asymptomatic to moderate upper respiratory tract illness (Su *et al.*, 2016). This latest SARS-COV-2 outbreak in December 2019 began in a local seafood market in Wuhan, Hubei province in Central China (Zhou *et al.*, 2020), with most initial infections not causing serious disease (CCDC, 2020), but it was believed to infect more people (Zou, *et al.*, 2020) with the potential for large-scale population spread in various countries (Zou *et al.*, 2020; Callaway, 2020).

The SARS-COV-2 strain of Coronavirus is novel, but it has already had a negative impact on humanity (Onyema *et al.*, 2020). As of April 2020, the global COVID-19 case count had reached one million cases, with over 220,000 deaths (Onyema *et al.*, 2020). Most SARS-related Coronaviruses were discovered in their natural bat reservoirs (Li *et al.*, 2005), and this virus was transmitted directly to humans from market mammals (Guan *et al.*, 2003), and then human to human (Zhou *et al.*, 2020), as well as transmission through contaminated surfaces (WHO, 2020a).

Fever, dry cough, breathing problems (dyspnoea), headache, pneumonia, gradual respiratory failure, and even death are common clinical symptoms of affected patients (Zhou *et al.*, 2020; Onyema *et al.*, 2020b). The risk of symptomatic infection increases with age, especially among adults aged 30–60 years, with a high mortality rate in those under 30 and over 60 years (Wu *et al.*, 2020; Mohit *et al.*, 2020). The earlier virus spread was linked to predisposing factors like overcrowding and increased human interaction in super-spreading

events and settings like the Diamond Princess Cruise ship, Chinese jails, and Daegu church in South Korea (Liu, 2020).

In 1918, a virulent type A virus triggered an influenza pandemic in Nigeria, which resulted in a short-term demographic catastrophe marked by widespread death and low national productivity (Ohadike, 1991). Similarly, the first index case in this current plaque was detected on February 27, 2020, and the outbreak has continued to spread through 19 states, including the Federal Capital Territory, with a total of 493 confirmed cases, 317 active cases, 159 discharges, and 17 deaths in the country 50 days after virus identification (NCDC, 2020a).

The NCDC recommends social distancing, hand washing with soap and sanitizers, and avoiding large and overcrowded gatherings, as well as human and vehicular travel limits, to prevent the virus from spreading (NCDC, 2020b).

Except for symptomatic care of infected patients, there is no known treatment for SARS Coronavirus (SARS-COV) and SARS-COV-2 (Hilgenfeld and Peiris, 2013). However, timely evidence from clinical trials of Remdesivir, lopinavir/ritonavir, and other possible chemotherapies will be apt and formidable in combating COVID-19 (Wu *et al.*, 2020). Reports of drug repurposing studies and in vitro cell culture drug effect on COVID-19 cells indicated that ivermectin (Caly *et al.*, 2020), chloroquine, favipiravir, remdesivir, and other existing broad-spectrum antiviral agents and antibiotics (Teicoplanin, Oritavancin, Dalbavancin, and Monensin) showed promising results at various stages of trials; nevertheless, the (Andersen *et al.*, 2020). Cyclohexylmethyl (11r) has shown possible antiviral activity against SAR-COV, MERS-COV, and the recent Coronavirus (Zhang *et al.*, 2020). Six other compounds, like Ebselen, have potentially inhibited the crystal structure of COVID-19 virus M^{pro} (also known as 3CL Protease) (Haito *et al.*, 2020).

According to Yang *et al.* (2020), despite the fact that there's yet to be an approved vaccine,

the vaccination of susceptible populations is essentially an acceptable and best practice for controlling SARS-COV and MERS-COV infections, including a vaccine against the recent Coronavirus SARS-COV-2 infections, because vaccine production is a costly, time-consuming, and labor-intensive process that involves many vaccine candidates and several years to produce a licensed vaccine (Gouglas *et al.*, 2018).

In the midst of the current pandemic, scientists around the world have stepped up efforts to conduct numerous studies for future vaccine production on a variety of scales, with encouraging results. According to the World Health Organization, there are over 70 COVID-19 vaccine candidates worldwide, three of which are in clinical trials at the time of this study (WHO, 2020c); Nigeria has indicated interest in solidarity in this clinical trial and control efforts (WHO, 2020d). The aim of this study is to evaluate public readiness for COVID-19 vaccination in the event of potential and early vaccine development.

Materials and Methods

Study Area

The Federal Capital Territory (FCT) is located between latitudes 8.25°N and 9.20°N of the equator and longitudes 6.45°E and 7.39°E east of the Greenwich Meridian and shares borders with the states of Kogi, Kaduna, Niger, and Nasarawa. Abuja, with a landmass of approximately 7,315 km², is geographically located in the center of the country. The territory is divided into six area councils: Abaji, Abuja Municipal, Gwagwalada, Kuje, Bwari, and Kwali (Olabode *et al.*, 2011) and has a total estimated population of 2,238,800 people (FCT Development Authority, 2015). The unique location, activity of the international airport and city function as the national administrative center premised this study.

Study Design

Over a four-week span, questionnaires were randomly distributed to individuals as they went out

jogging, strolling, or shopping on days approved by the government during the lockdown, while adhering to NCDC safety measures such as hand sanitizers, nose masks, hand gloves, and maintaining a physical distance of at least two meters. Throughout the report, the data collectors had digital thermometers in their possession at all times. In total, 200 people were interviewed in each of the six area councils, for a total of 1,200 respondents in this survey. The data collectors took care of and registered all answers to the questionnaire description.

Questionnaire

Questions outlined in the questionnaire include: name, gender, age, religion, marital status, number of children, state of origin, state of residence, highest educational qualification, job, if vaccine would be accepted and taken when produced and reasons why if not.

Data Analysis

Frequency and percentage were used to represent the data. The association between variables was determined using Pearson's Chi square test, with a P-value of 0.05 and a 95% confidence interval. All analysis was performed using SPSS version 21 (2015).

Results

In the current study, the male population in all council areas was higher than the female population. In all six area councils studied, males made up 81.0% (n=973) of the total population studied, compared to their female counterparts (18.5%; n=222).

The distribution of vaccination response for COVID-19 vaccines in Abuja is shown in Table 1. There was a statistically significant relationship between gender and vaccination response rate ($p < 0.05$) in Abuja Municipal Area Council; of the 200 participants, 50.0% (n=100) of males and 31.0% (n=62) of females agreed to obtain

vaccinations. This acceptance rate was higher than in Gwagwalada Area Council, where 40.5% (n=81) of males and 19.5% (n=39) of females agreed to receive COVID-19 vaccines when they became available.

Kwali Area Council had the highest acceptance rate among males and females, with 60.0 % (n=120) males and 36.5% (n=73) females agreeing to receive COVID-19 vaccines if offered.

Table 1: Distribution of Vaccination response for COVID-19 vaccine in Abuja-FCT, Nigeria

Location	Gender	Vaccination Response Freq. (%)				Gender Frequency	χ^2 (sig)	Phi	Cramer's V
		Yes	No	Maybe	Indifferent				
AMC									
	Male	100 (80.6)	24 (19.4)	-	-	124 (62.0)			
	Female	62 (81.6)	14 (18.4)	-	-	76 (38.0)			
	Total	162	38	-	-	200	0.027(0.870)	-0.012	0.012
Gwagwalada									
	Male	81 (61.8)	48 (36.6)	2 (1.5)	0 (0.0)	131 (65.5)			
	Female	39 (56.5)	27 (39.1)	0 (0.0)	3 (4.3)	69 (34.5)			
	Total	120	75	2	3	200	7.036 (0.071)	0.188	0.188
Kuje									
	Male	113 (88.5)	15 (11.7)	-	-	128 (64.0)			
	Female	56 (77.8)	16 (22.2)	-	-	72 (36.0)			
	Total	169	31	-	-	200	3.881 (0.049)	0.139	0.139
Kwali									
	Male	120 (97.6)	3 (2.4)	-	-	123 (61.5)			
	Female	73 (94.8)	4 (5.2)	-	-	77 (38.5)			
	Total	193	7	-	-	200	1.065 (0.302)	0.073	0.073
Abaji									
	Male	103 (81.7)	23 (1.8)	-	-	126 (63.0)			
	Female	57 (77.0)	17 (23.0)	-	-	74 (37.0)			
	Total	160	40	-	-	200	3.162 (0.531)	0.126	0.126
Bwari									
	Male	104 (83.9)	20 (16.1)	-	-	124			
	Female	65 (85.5)	11 (14.5)	-	-	76			
	Total	169	31	-	-	200	0.099 (0.754)	-0.022	0.022
Total		973 (81.0)	222 (18.5)	2 (0.16)	3 (0.25)	1200			

Table 2: Distribution of Vaccination response against COVID-19 vaccine in Abuja-FCT, Nigeria

Location	Response	Gender		χ^2	Phi	Cramer's V
		Male	Female			
AMC	Believe in God	6 (4.8)	2 (2.6)			
	Lack of trust for the vaccine	4 (3.2)	1 (1.3)			
	Dislike drugs/injections	12 (9.7)	9 (11.8)			
	Fear	1 (0.8)	1 (1.3)			
	It won't protect/remedy	1 (0.8)	0 (0.0)			
	No reason/undecided	0 (0.0)	1 (1.3)			
	Total	24	14	3.844 (0.698)	0.139	0.139
Gwagwalada	Response	Gender		χ^2	Phi	Cramer's V
		Male	Female			
	Believe in God	1 (0.8)	1 (1.4)			
	Lack of trust for the vaccine	25 (19.1)	20 (23.2)			
	No virus infection in Nigeria	6 (4.7)	3 (4.3)			
	Personal reasons	5 (3.8)	0 (0.0)			
	Not interested	2 (1.6)	0 (0.0)			
	It won't protect/not a Remedy	1 (0.8)	1 (1.2)			
	Need for proper education	3 (2.4)	0 (0.0)			
	No reason/undecided	3 (2.4)	0 (0.0)			
	No to occult/new world order	1 (1.6)	1 (1.4)			
	Undeveloped & clinical trial of vaccine	0 (0.0)	1 (1.4)			
	Deadly side effect	1 (0.8)	0 (0.0)			
Total	48	27	17.926 (0.592)	0.299	0.299	
Kuje	Response	Gender		χ^2	Phi	Cramer's V
		Male	Female			
	Believe in God	9 (7.0)	7 (9.7)			
	Lack of trust for the vaccine	0 (0.0)	2 (2.8)			
	Dislike drugs/injections	4 (3.1)	6 (8.3)			
	Fear	1 (0.8)	0 (0.0)			
	Not interested	0 (0.0)	1 (1.4)			
Prefer herbal remedy	1 (0.8)	0 (0.0)				
Total	15	16	9.977 (0.126)	0.223	0.223	
Kwali	Response	Gender		χ^2	Phi	Cramer's V
		Male	Female			
	Believe in God	1 (0.8)	2 (2.6)			
Dislike drugs/injections	2 (1.6)	2 (2.6)				
Total	3	4	1.266 (0.531)	0.08	0.08	
Abaji	Response	Gender		χ^2	Phi	Cramer's V
		Male	Female			
	Believe in God	3 (2.4)	5 (6.8)			
	Lack of trust for the vaccine	8 (6.3)	4 (5.4)			
	Dislike drugs/injections	4 (3.2)	3 (4.1)			
	Fear	3 (2.4)	2 (2.7)			
	No virus infection in Nigeria	2 (1.6)	1 (1.4)			
	Personal reasons	1 (0.8)	0 (0.0)			
	Not interested	1 (0.8)	0 (0.0)			
No reason/undecided	0 (0.0)	1 (1.4)				
Not produced in Nigeria	1 (0.8)	1 (1.4)				
Total	23	17	7.637 (0.745)	0.195	0.195	
Bwari	Response	Gender		χ^2	Phi	Cramer's V
		Male	Female			
	Believe in God	8 (6.5)	6 (7.9)			
	Dislike drugs/injections	7 (5.6)	3 (3.9)			
No virus infection in Nigeria	5 (4.0)	2 (2.6)				
Total	20	11	0.691 (0.875)	0.59	0.59	
Total		133 (59.9)	89 (40.0)			

Table 3: Demographic distribution of COVID-19 Vaccination respondents in Abuja-FCT, Nigeria

Location	Religion				Marital Status								Educational Status								Occupation			
	Christianity		Islam		Single		Married		Widow		Widower		No Qualification		Undergraduate		Graduate		Postgraduate		Public (Formal)		Private (Informal)	
AMAC	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
3967	89	13	73	25	85	13	77	25	0	0	0	0	0	0	76	22	83	16	3	0	51	6	111	32
(%)	87.3	12.7	74.5	25.5	86.7	13.3	75.5	24.5	0.0	0.0	0.0	0.0	0.0	0.0	38.0	11.0	41.5	8.0	1.5	0.0	25.5	3.0	55.5	16.0
χ^2	5.292 (0.021)				4.106 (0.043)								4.990 (0.417)								46.989 (0.0001)			
Gwags	101	66	19	14	81	58	39	22	0	0	0	0	3	2	63	42	45	32	8	4	39	19	82	55
(%)	60.5	37.7	57.6	36.4	58.3	38.8	63.9	34.4	0.0	0.0	0.0	0.0	60.0	40.0	61.0	39.0	60.8	39.2	38.0	62.0	19.5	9.5	41.0	27.5
χ^2	10.766 (0.013)				1.337 (0.720)								40.858 (0.167)								31.657 (1.00)			
Kuje	94	16	75	15	80	9	85	22	2	0	2	0	0	0	75	18	94	13	0	0	64	6	106	26
(%)	85.5	14.5	83.3	16.7	89.9	10.1	79.4	20.6	100	0.0	0.0	0.0	0.0	0.0	37.5	9.0	47.0	6.5	0.0	0.0	32.0	3.0	53.0	13.0
χ^2	0.17 (0.680)				4.798 (0.187)								5.068 (0.280)								44.991 (0.001)			
Kwali	109	5	84	2	57	3	133	4	2	0	1	0	0	0	131	5	62	0	0	0	38	1	155	6
(%)	95.6	4.4	97.7	2.3	95.0	5.0	97.1	2.9	100	0.0	100	0.0	0.0	0.00	65.5	2.5	31.0	0.0	0.0	0.0	19.0	1.0	77.5	3.0
χ^2	0.616 (0.432)				0.645 (0.886)								32.254 (0.001)								17.344 (0.431)			
Abaji	93	21	70	16	79	12	83	25	1	0	0	0	3	0	99	21	60	11	2	7	37	22	115	26
(%)	81.5	18.4	81.2	18.6	85.7	13.2	75.0	23.1	0.5	0.0	0.0	0.0	100	0.0	49.5	10.5	30.0	5.5	1.0	3.5	18.5	11.0	57.5	13.0
χ^2	2.836 (0.586)				6.495 (0.592)								61.584 (0.171)								642.327 (0.001)			
Bwari	91	15	78	16	94	9	72	22	1	0	2	0	3	0	92	13	74	18	0	0	60	13	110	20
(%)	85.8	14.2	74.5	17.0	91.3	8.7	76.6	23.4	100	0.0	100	0.0	1.5	0.0	46.0	6.5	37.0	9.0	0.0	0.0	30.0	5.0	55.0	10.0
χ^2	0.313 (0.576)				8.630 (0.035)								3.109 (0.540)								55.513 (0.0001)			
Total	577	136	399	88	476	104	489	120	6	0	5	0	9	2	536	121	418	90	13	11	289	67	679	165
	1200				1200								1200								1200			

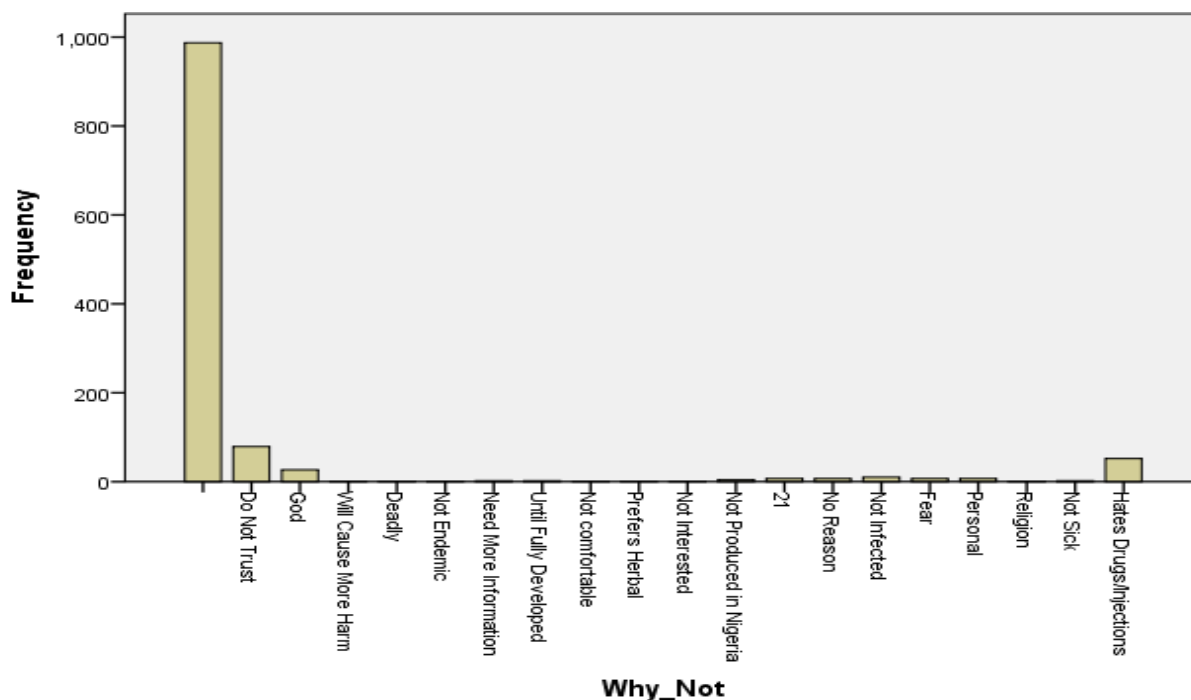


Figure 1: Reasons for apathy against anticipated COVID-19 vaccination in Abuja

The current study shows that, 5 (0.4%) of the participants were indifferent to receiving COVID-19 vaccine, while 219 (18.3%) of the participants did not support the use of COVID-19 vaccine for various reasons, as seen (Fig. 1). Of the 18.3 % who said “No,” 79 (6.6 %) had no believe in the protective effect of vaccination against the virus and 27 (2.3 %) believe in God for protection against the virus, and that getting vaccinated will only go against their religious beliefs; while a handful believe the disease is not prevalent in Nigeria and that the vaccine may be deadly and cause more harm, making them uncomfortable and uninterested.

Others (0.8%) say they are free of infection, and (0.6%) respondents were uninterested in the vaccine due to their apprehension of injectable drugs (4.3%). Respondents (0.2%) want more knowledge before the vaccine is fully developed since much of the research and development was done outside of Nigeria (0.3%). Some respondents (0.6%) had no reason for rejecting to be vaccinated other than their individual dislike for it. However, 0.1% of participants would rather use natural remedies than the vaccine suggested.

Distribution of Vaccination response against COVID-19 vaccine in Abuja-FCT, Nigeria

Table 2 indicates the responses of respondents who said they would refuse the vaccines if they were made available. The main reason for vaccine rejection was a lack of confidence in the vaccines, accompanied by respondents' faith in God. Although some respondents cited a fear of injections as a justification for refusing the vaccine, others are skeptical that the novel coronavirus exists in Nigeria.

Demographic distribution of COVID-19 Vaccination respondents in Abuja-FCT, Nigeria

The demographics of COVID-19 vaccination responses among residents of the Federal Capital Territory is shown in Table 3. Religion and marital

status had a substantial impact on respondents' decisions about COVID-19 vaccines in Abuja Municipal Area Council, according to the findings. Religion influenced respondents' decision to embrace vaccines in Gwagwalada ($p < 0.05$), while marital status influenced respondents' decision in Bwari ($p < 0.05$).

Discussion

Despite the imminent signs of global transmission and danger, the coronavirus COVID -19 emerged when the country was unprepared, with little to no national preparedness plan. Following confirmation of the index case, the Federal Government of Nigeria (FGN), through the Federal Ministry of Health (FMOH), Nigeria Centre for Disease Control (NCDC), and other related stakeholders, swung into motion, imposing an international travel ban, nationwide movement limits, social distancing, hand washing with soap and hand rubs, and complete lockdown in Lagos, Ogun, and Abuja.

Observational analysis of infection and activity patterns in Abuja reveals ineffective compliance with restriction directives by the public, especially in the Area Councils, where local and community spread could be striking and overwhelming during this study. Hence, necessitating an intervention approach that champions the use of efficient vaccines against the virus (Eyal *et al.*, 2020), since respondents of the current study show a high degree of support for vaccination efforts.

However, the length of immunity, the number of necessary doses, and the possibility of re-infection in previously infected but recovered individuals are all possible roadblocks to its successful use (Lurie *et al.*, 2020). Respondents' mixed feelings concerning the topic may be attributed to the controversial connection between 5G satellite network installations and the ongoing COVID-19 pandemic (Jacquet, 2020). Many would rather wait for more information on the vaccine noting that the vaccine may be deadly. Their fears may

be due to some notable unscientific write-ups and videos shared on various social media platforms implying that the coronavirus is a deliberate weapon designed for global economic collapse to achieve a political agenda.

Another community of people believes in God rather than vaccines because it goes against their religion. Their belief may stem from a series of sermons preached in religious gatherings, regardless of religious affiliation as Christians (Toromade, 2020) or Muslims. Other respondents stated that they were not sick because the disease is not severe in their vicinity as reported in other parts of the world. The perceived low community spread and disease burden may be related to the widespread use of Bacillus Calmette-Guerin (BCG) vaccines in Nigeria for infant immunization (Oladokun *et al.*, 2009); the same reason Berg *et al.* (2020) opines a flattened curve for cases of COVID-19 infection and deaths in country-wide outbreaks (Berg *et al.*, 2020).

Searches in English, French, and Chinese, from science databases and clinical trial repositories suggest that Bacillus Calmette-Guerin (BCG) vaccines are not licensed for the cure or prevention of the novel coronavirus (WHO, 2020b). The effect of the vaccine against the virus is yet to be established, and the clinical significance remains unknown (Arts *et al.*, 2018).

As a result, some respondents tend to use natural and home remedies rather than the proposed vaccine being produced outside of Nigeria because they fear injectable drugs. In conclusion, this finding suggests that COVID-19 infection and pandemic are legendary, and the residents of the study area were willing to consider vaccination if a vaccine was created. Policymakers should therefore provide funds to maintain ongoing containment initiatives and build a strong enabling climate for researchers to improve national, regional, and global collaborative research for rapid vaccine production.

Conclusions

The study emphasizes the need for enhanced public awareness about the COVID-19 vaccination to raise general knowledge about the vaccine's potential and to eliminate conspiracy theories and other factors found in the study that could obstruct the vaccine's smooth administration once it becomes accessible in the world.

Competing interests

Authors have declared that no competing interests exist.

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