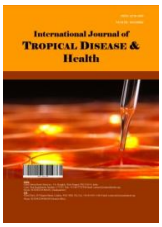

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COVID-19 Vaccine Knowledge and Acceptability among Healthcare Providers in Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. Author OCE conceptualized the work, designed the study and participated in the procedures, data collection and analysis and manuscript development. Author VCO designed the study, participated in the data collection, procedures, literature review, manuscript development and review. Author PCA Participated in the study design, procedures, and data collection and did the data analysis and review. Author CPN participated in the data collection, procedures, literature review and review. Author NED participated in the data collection, procedures and review. Author MCE participated in the data collection, procedures and review. All authors read and approved the final manuscript.

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ABSTRACT

Background: The Covid-19 pandemic has posed enormous challenges and has become a burden of morbidity and mortality while severely disrupting economic activities around the world. Vaccines for the disease has been discovered; however, there exists misconceptions and mistrusts among health workers which may constitute barriers to Covid-19 uptake.
Aim: The study aimed to determine the knowledge and acceptability of the Covid-19 vaccine among health care provider and to determine the association between the socio-demographic variables and Covid-19 acceptability.
Study Design: A snowball sampling technique was relied upon in the distribution of the questionnaires.
Place and Duration: Online questionnaires sent in the form of a link through social media outlets such as Whatsapp, Facebook and emails within four weeks interval.
Methodology: Health care providers in Nigeria aged 18 years and above participated in this study.The analysis was performed using the Statistical Software Package SPSS version 22.0.Four hundred and forty-five respondents filled the questionnaire from the six geopolitical zones of the country.
Results: There was a good knowledge of the Covid-19 vaccination as 411(92.4%) knew about the vaccine. However, only 53.5% of respondents were willing to get vaccinated against the disease. The most identified perceived barrier to covid-19 vaccine acceptance was fear of side effects 309 (69.4%) and there was no association between socio-demographic characteristics and covid-19 vaccine acceptability.
Conclusion: Healthcare providers recommendation and confidence in a vaccine plays an influential role in their patients' vaccination behaviour. They serve as an important source of information for the general populace and their consultation can also be a key factor in patients' decision to get vaccinated or not.

Keywords: Acceptability; health care providers; hesitancy; knowledge; vaccine.

1. INTRODUCTION

The Covid-19 pandemic, as expected, has posed enormous challenges and has become a burden of morbidity and mortality while severely disrupting economic activities around the world[1].The Corona virus disease 2019 (Covid-19) has become a worldwide pandemic spreading across the globe with millions of people infected and recording hundreds of thousands of deaths[2,3]. The World Health Organisation declared the novel human Corona virus disease outbreak which was first reported in Wuhan China on December 8, 2019, a public health emergency of international concern on January 30, 2020 [4].Hitherto, the WHO has categorized Nigeria as one of the 13 African countries at high risk of spread[5].Nigeria is also among the vulnerable countries in Africa predicted to experience an accelerated spread of the Covid-19 virus owing largely to the weak state of health infrastructure and health systems [5].

Although the world has recorded a dismal landmark of 1.6 million Covid-19 related deaths, it is, however, evident that herd immunity is still far-fetched [6]. Vaccination therefore will be paramount to achieve a level of population immunity that will help to further prevent the Covid-19 spread. Aside from the technological and medical hurdles involved in vaccine production, one of the major challenges of the vaccine industry is vaccine hesitancy, which is a delay in accepting to be vaccinated or refusing its use altogether [6]. The danger of this is the unnecessary prolongation of the pandemic notwithstanding that a vaccine has been rolled out. This could lead to additional loss of lives among the vulnerable population especially those who may have legitimate reasons for not taking the vaccine.

WHO has declared that vaccine hesitancy is among the 10 major global health threats [7].The World Health Organisation (WHO) Strategic Advisory Group of experts in immunization 2015 defined vaccine hesitancy as a delay in acceptance or total refusal of vaccination despite the availabilityof vaccination services [7]. In many countries, vaccine hesitancy and misinformation are public health problems and pose as a major barrier to achieving coverage and community immunity [8,9].

Governments, public health organisations and advocacy groups must be proactive and prepared to address vaccine hesitancy and build vaccine literacy so that accept ability rate of the Covid-19 vaccine will be maximal. Anti-vaccination activists in different countries are thriving on conspiracy theories and dispelling fears and campaigning against the need for vaccination with some denying the existence of the disease altogether [10]. Misinformation and spread of different conspiracy theories especially through social media could incredibly affect the acceptance rate of the vaccine [11]. The accelerated pace with which the vaccine was produced and developed also went further to heighten public anxieties and invariably will affect vaccine acceptance. Immunization programs are largely only successful when there are high rates of acceptance and coverage [12]. To achieve this onerous task of wide coverage and acceptability, it is critical to understand risk perceptions about the Covid-19 vaccine, acceptance of the vaccine and confidence in media sources, especially those that were utilised in obtaining information about the pandemic ab initio[12].

Although vaccination has proven to be the age-long technique used in reducing diseases burden and mortality, public confidence in a particular vaccine can be affected by numerous concerns. As such, vaccine hesitancy can have serious detrimental effects and contribute marginally to continued or prolonged outbreaks. A typical example is the 2003-2004 boycott of polio vaccine in some parts of Northern Nigeria, which led to the resurgence of the disease [13,14]. This single scenario till today continues to constitute a public distrust and contributed significantly to the delayed eradication of polio in that region. Research has shown that the quality, content and dissemination of health education about vaccines will help in promoting acceptability, reduce hesitancy and guide informed decisions about vaccination [15].

The study aimed to determine the knowledge and acceptability of the Covid-19 vaccine among health care providers who are front-liners in the war against the Covid-19 Pandemic. To identify the perceived barriers to vaccine uptake among them and to determine the association between the sociodemographic variables and Covid-19 acceptability. This knowledge of healthcare workers on Covid-19 vaccine and their acceptability of same will constitute a basis for their recommendation of this vaccine to patients, which will contribute towards combating the pandemic.

1.1 Research Questions

1. What is the knowledge of Covid-19 vaccine among healthcare providers in Nigeria?
2. Are healthcare providers in Nigeria willing to and acceptability of the Covid-19 vaccine?
3. What are the perceived barriers to vaccine uptake among healthcare providers in Nigeria?
4. Is there an association between the sociodemographic variables of healthcare providers and Covid-19 acceptability?

2. MATERIALS AND METHODS

2.1 Study Location

Nigeria is a country in West Africa with a population of approximately 202 million people.

There are three major ethnic groups in Nigeria;Hausa, Igbo and Yoruba. Nigeria is made up of36 states and the Federal Capital Territory. These states are located within six geopolitical zones in Nigeria: North-Central, North-East, North-West, South-East, South-South and South-West. In as much as, Nigeria is rich in natural resources with crude oil as its main export, the majority still live in poverty with a minimum monthly wage ofN30,000 (approximately $80 a month).According to the World Bank, Nigeria is classified as a low-income country with a rise in unemployment as the core reason for elevated poverty levels, regional and gender inequalities, and socio-political problems[16].

2.2 Sampling Method

A snowball sampling technique was utilized in the distribution of the online questionnaires sent in the form of a link through social media outlets such as WhatsApp, Facebook and emails.

2.3 Study Participants

Health care providers in Nigeria aged 18 years and above with access to the internet and social media.

2.3.1 Inclusion criteria

Health care providers in Nigeria with at least, one year working experience aged 18 years and above who were willing to participate in the study.

2.3.2 Exclusion criteria

Respondents who declined informed consent, health care workers who are not in Nigeria, even though they may be Nigerian nationals and respondents less than 18years old.

2.4 Data Collection

An online survey was created using the free software Google form and distributed through social media networks (WhatsApp, Facebook, emails). Data were collected within 4 weeks interval. The questionnaire had four sections; informed consent, participant's demographics, information on Covid-19 vaccine acceptability, Covid-19 vaccine barriers to uptake. The participants' demographics assessed include age, gender, state of residence and geographical zones, ethnicity, religion, marital status and health care sector.

2.5 Statistical Analysis

Analysis was performed using the Statistical Software Package SPSS version 22.0. Descriptive statistics (including means and standard deviations) were calculated for the numerical variables.

3. RESULTS

Majority of the respondents 395(88.8%) have been vaccinated against a disease at least once in their lifetime and 23(5.2%) have tested positive to Covid-19, 162(36.4%) think they have experienced symptoms of the disease. Majority of the respondents 411(92.4%) had good knowledge of Covid-19 vaccine.A little over half of the respondents (53.5%) were willing to accept Covid-19 vaccine. If the vaccine is proven safe, 214(48.1%) of the respondents will still be unwilling to accept the vaccine.

Out of the 445 respondents, 309 (69.4%) identified fear of side effects as a perceived barrier to Covid-19 vaccine uptake, this was followed by those who felt that the vaccine is unsafe (262(58.9%) while the least perceived barrier was cultural disapproval 13 (2.9%).

The association between willingness to accept Covid-19 vaccine and socio-demographic characteristics of the respondents was not statistically significant.

4. DISCUSSION

The study was conducted to assess the acceptability of Covid-19 vaccination among healthcare providers in Nigeria. An online questionnaire was developed and shared among healthcare providers across the six geopolitical zones in the country using social media platforms. The pandemic is considered a public health emergency and healthcare workers are on the frontline of this epidemic hence standing a greater risk of contracting the disease. Therefore, every measure of safety practices and prevention strategies are of immense importance so as to reduce disease spread.

4.1 Acceptability of Covid-19 Vaccine among Respondents

This study had 53.5% of respondents being willing to take the vaccine which showed lower vaccine acceptance when compared with the work done by Jiahaowang et al in China [17]where 91.3% of the participants stated that they intended to receive covid-19 vaccine if it is developed successfully. This vaccine acceptance rate of 53.5% is also low when compared also with a study conducted in France by DetocM et al. [18], which revealed that 77.6% of the study population agreed that they will take the vaccine. This low acceptance in our study may be explained by the harm of social networks and the spread of misinformation. However, 46.5% of respondents in this study showed hesitance to take vaccine when it gets to the country, this percentage is in disagreement and varies from the survey done among health care workers in Congo by Michel Kabmba Nzajiet al. [19] who recorded 72% being unwilling to receive the vaccine when it is made available.

4.2 Perceived Barriers to Covid-19 Vaccine Acceptance

The most identified perceived barrier to Covid-19 vaccine uptake was the fear of side effects, with 309(69.4%) respondents noting it as a barrier, this was followed by those who feel that the vaccine is unsafe 262(58.9%), those who do not trust the vaccine – 187(42.0%), and those who feel they are not exposed to potential Covid-19 patients – 141(31.7%). Furthermore, disapproval from colleagues was another indicated barrier by 101(22.7%) respondents and lack of support by their employer was indicated by 79(17.8%) respondents. About 53(11.9%) respondents will not accept the vaccine because government

Table 1. Socio-demographic features of respondents

Characteristics	Number (total: n=445)	Percentage (%)
Age (years)		
≤ 20	4	0.9
21-30	162	36.4
31-40	221	49.7
41-50	49	11.0
51-60	8	1.8
>61	1	0.2
Gender		
Male	292	65.6
Female	153	34.4
Marital status		
Single	206	46.3
Married	233	52.4
Divorce/Separated	2	0.4
Cohabiting	3	0.7
Widowed	1	0.2
Religion		
Christianity	400	89.9
Muslim	35	7.9
Traditionalist	2	0.4
Others	8	1.8
Profession		
Doctor	170	38.2
Nurse	37	8.3
Radiographer/Imaging Scientist	11	2.5
Public Health Workers	41	9.2
Dentist/Dental Therapist	1	0.2
Optometrist	4	0.9
Scientific Officer	6	1.3
Medical Laboratory Scientist	121	27.2
Pharmacist	36	8.1
Medical Record Officer	5	1.1
Physiotherapist	8	1.8
Hospital Cleaner	5	10.1
Cadre of Hospitals		
Primary Healthcare Centre	30	6.7
General Hospital	49	11.0
Specialist Hospital	41	9.2
Teaching Hospital	134	30.1
Private Practice	84	18.9
Public Health Organizations	9	2.0
NGO	88	19.8
Ministry of Health	10	2.2
Geopolitical Zone		
North Central	60	13.5
North East	43	9.7
North West	29	6.5
South East	157	35.3
South South	105	23.6
South West	51	11.5

Table 2. Acceptability of COVID-19 vaccine among respondents

Variables	Frequency n=445	Percentage (%)
Vaccinated for anydisease before		
Yes	395	88.8
No	35	7.9
Can't remember	15	3.4
Tested positive to Covid-19		
Yes	23	5.2
No	422	94.8
Ever had symptoms of Covid-19		
Yes	162	36.4
No	283	63.6
Knowledge about Covid-19 vaccine		
Yes	411	92.4
No	34	7.6
Willingness to vaccination		
Yes	238	53.5
No	207	46.5
Will vaccinate him/herself if proven safe		
Yes	231	51.9
No	214	48.1

Table 3. Perceived barriers to COVID-19 vaccine acceptance

Variables	Frequency n=445	Percentage (%)
Fear of side effect	309	69.4
Safety concerns about vaccine	262	58.9
Family disapproval of vaccine	25	5.6
Discouragement from Religious leaders	32	7.2
Lack of trust in vaccine	187	42.0
Disapproval from colleagues	101	22.7
No exposure to potential Covid-19 patients	141	31.7
Poor knowledge of vaccine	60	13.5
Culture does not support	13	2.9
Lack of support by employer	79	17.8
Government officials not accepting vaccine uptake	53	11.9

***Multiple responses allowed*

officials are not taking the vaccines, poor knowledge about the vaccine was a barrier to 60(13.5%) respondents, discouragement from religious leaders constituted a barrier to 32(7.2%) respondents, lack of family approval 25(5.6%) and cultural disapproval constituted a barrier to 13(2.9%) respondents. In this context, where our respondents who are health care providers, the front-liners, already perceive what would prevent them from getting the vaccine which is not even readily available in the country, how much more what a non-health worker would come up with. There is a paramount need for addressing concerns and increasing awareness to improve chances for higher acceptance of the vaccine. Otherwise, there is an increased chance of mass rejection of the vaccine in the general population when the vaccine becomes available.

4.2.1 Association between willingness to accept Covid-19 vaccine and socio-demographic features of respondents

The majority of the respondents were of the age of 31-40 years, of which 116(48.7%) were willing to accept theCovid-19 vaccine if proven safe and 105(40.4%) respondents aged 31-40 years were unwilling to accept the vaccine. 28(13.6%)

Table 4. Association between willingness to accept Covid-19 vaccine and socio-demographic features of respondents

			Willingness to accept _Vaccine		Df	Chi-square	P value
			Yes	No			
Age (years)		≤ 20	1	3	5	7.480	0.187
		21-30	96	66			
		31-40	116	105			
		41-50	21	28			
		51-60	3	5			
Gender	Male		162	130			
	Female		76	77	1	1.360	0.243
Religion	Islam		19	16			
	Traditional		2		3	2.048	0.563
	Others		5	3			
	Christianity		212	188			
Profession	Doctor		93	77			
	Nurse		19	18	11	15.656	0.207
	Radiography/Imaging scientist		4	7			
	Public Health Worker		29	12			
	Dentist/Dental Therapist		1				
	Optometrist		3	1			
	Scientific officer		3	3			
	Med. laboratory scientist		63	58			
	Pharmacist		18	18			
	Medical Records Officer		1	4			
	Physiotherapist		2	6			
	Hospital Cleaner		2	3			

**Statistical significance based on p<0.05*

respondents within ages 41-50 years were unwilling to accept the Covid-19 vaccine. Analysis using the Chi-square showed that this difference based on age was not statistically significant (P=0.0187; df=5, X^2=7.480). Based on gender, the male respondents 162(36.4%) were more willing to accept the vaccine than female respondents 76(17.1%). This difference based on gender was not statistically significant (P=0.244; df=1, X^2=1.360). Religious affiliation of respondents showed no statistically significant association with the willingness of respondents to accept the Covid-19 vaccine (P=0.563; df=3, X^2=2.048). The religion of the respondents showed Christians has the highest response of 89.9% while Muslims had a response rate of 7%. However, out of the total Christian respondents (n=400), 47% (n=188) showed vaccine hesitancy while 84% (n=16) of the total Muslim respondents (n=35) showed vaccine hesitancy. This finding when compared to reports from literature reveals that Muslims have shown strong hesitancy to vaccines for various reasons in the past, including conspiracy theories. This is the case as seen in the 2000s, in Pakistan, Afghanistan, and Northern Nigeria where some Muslim religious leaders advised their faithful not to accept the oral polio vaccine perceived to be a plot by the Westerners to decrease Muslim fertility [20]. There have also been recurring fears that vaccines production entails the use of animal-derived gelatine which is prohibited by Koranic norms. For example, trace amounts of pig products in the measles-mumps-rubella vaccine led Islamic leaders in Indonesia to issue a vaccine fatwa (a religious blacklisting) in 2018 which cause a sharp plunge in measles vaccine acceptance [20]. The view above, however, conflicts with a study in Indonesia in 2020 on Covid-19 vaccine acceptability where a survey carried out indicated that 73% of the study populations who were Muslims showed willingness to accept Covid-19 vaccine while 29% were indecisive. The Indonesian ULEMA Council, the country's top Islamic body however, ensured that the vaccines would be 'halal' or permissible under the Islamic law [20].

5. STRENGTH AND LIMITATION

All the geo-political zones were represented to display the unique socio-demographic characteristics of the respondents. However, the response from the Northern region was low which might be due the cultural norms of the Northerners and their unwillingness to fill the online questionnaire.

6. CONCLUSION AND RECOMMENDATION

The study was aimed at determining the Covid-19 vaccine knowledge and acceptability among Healthcare Providers in Nigeria. Healthcare provider's recommendation and confidence in a vaccine plays an influential role in their patient's vaccination behaviour. They serve as an important source of information for the general populace and their consultation can also be a key factor in patient's decision to get vaccinated or not. Therefore, educating them more about the safety of the vaccine is paramount in other to help save the population at large. Misinformation and conspiracy theories on social media platforms generate a sense of falsehood on risks associated with the covid-19 vaccine and hence, the need for training health care providers cannot be overemphasized as they bridge the gap on information for their patients. The government should also be proactive in providing the vaccine in the country and make necessary grass-root campaign about the safety of the vaccine uptake and not the usual way we do things because this is a novel pandemic and therefore should be handled as one because the safety of the populace is very paramount and second to none.

CONSENT AND ETHICAL APPROVAL

The guidelines on research involving the use of human subjects according to the Helsinki declaration was adhered to. Online consent was obtained from participants. Participants were allowed to leave the survey at any time they desired. Confidentiality of information was assured, and the survey was anonymous.

This study was approved by the scientific and ethics review board of Nnamdi Azikiwe University Teaching Hospital nnewi, Anambra State, Nigeria.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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