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ORIGINAL ARTICLE

Willingness to Accept COVID-19 Vaccine among Anaesthetists in Nigeria

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Keywords

Willingness; Acceptance; Anaesthetists; COVID-19; Nigeria.

ABSTRACT

Background: Critical measures in the prevention and control of COVID-19 disease require health care professionals. This study aimed to assess the willingness to accept COVID-19 vaccine among anaesthetists in Nigeria.

Methods: A descriptive cross-sectional study involving the total population of anaesthetists in Nigeria was carried out with the use of self-administered questionnaires. Data were analyzed using IBM SPSS version 21.0 statistical software.

Results: A total of 195 respondents were assessed during this study. All of them were aware of COVID-19 disease, 119 (61%) had a good knowledge of COVID-19 disease while 57 (29.2%) and 19 (9.7%) had fair and poor knowledge, respectively. Over half of the respondents, 103 (52.8%) were willing to accept the vaccine. Predictors of willingness to accept the vaccine included being of the male gender (AOR=2.5, 95%CI=1.213-5.246, p=0.013), being from the South-west geopolitical zone (AOR=3.134, 95% CI= 1.353-8.651, p=0.020) and having a good knowledge of the vaccine (AOR=14.910, 95%CI=6.114-36.359, p= <0.001).

Conclusion: Slightly over half of the respondents were willing to accept COVID 19 vaccines. There is an urgent need for tertiary health institutions in Nigeria to sensitize anaesthetists especially the females on the need to accept the vaccine.

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INTRODUCTION

The Coronavirus disease (COVID-19) is an illness caused by the novel coronavirus called Severe Acute Respiratory Syndrome Coronavirus 2 (SARS CoV 2), which was first identified amid an outbreak of respiratory illness cases in Wuhan, China in December 2019.[1] The disease was declared a pandemic by the World Health Organization (WHO) on the 11th of March 2020; where more than 155 countries reported the disease.[2] COVID-19 disease, became particularly worse in the United States of America, Italy, Spain, Germany, France, Iran, United Kingdom, Switzerland and Turkey in March 2020.[3] The disease spread to some countries in Africa two months after it was first identified in China. Within the same period, the first case was reported in Nigeria on the 27th of February 2020.[4] The global picture as at 11th April, 2022 revealed 497,057,239 confirmed cases and 6,179,104 deaths from the disease. Part of these cases and mortalities were recorded in 47 countries in Africa, including Nigeria; which had 8,283,913 cases and 170,459 deaths.[5]

The COVID-19 pandemic has resulted in excesses of human mortalities, disruption of socio-cultural lifestyles and the plunging of national economies into deep recessions. It has also taken its toll on disruption of already weak health systems especially in developing countries.[1, 6] Some of the recommended critical measures in the prevention and control of this disease include physical distancing, face coverings, contact tracings, various forms of therapeutics and the use of COVID-19 vaccines. Vaccination against COVID-19, particularly guarantees better reduction in mortalities, hospitalizations and community transmission of the infection.[6,7]

As the COVID-19 vaccines are currently being introduced into our societies, priorities should be given to health workers and the vulnerable population. Health care workers (HCWs), especially those handling medical emergencies face greater risk of becoming infected and dying from COVID-19.[7] They have been described as the critical infrastructure workers, who should be prioritized for COVID-19 vaccination because of their exposure to greater risks and psychological distress during the COVID-9 pandemic.[8] Anaesthetists, who typically provide anaesthesia and critical care in various health institutions, are particularly among the top clinical specialties at risk of contracting COVID-19 disease, due to the critical care they provide.[9] Some of the major predisposing procedures by these health care professionals include high flow nasal oxygen therapy, continuous positive airway of pressure, high-frequency ventilation, laryngoscopy and intubation airway chest physiotherapy, nebulizer treatment, sputum induction, bronchoscopy, positive-pressure mechanical ventilation, cardiac arrest management.[1, 10, 11]

Nonetheless, availability and access to the COVID-19 vaccine may not necessarily translate to its higher uptake. The health care workers behaviour represents a major step towards not just the individual uptake of the vaccine but the recommendation, which may eventually translate to higher uptake within the larger society.[7] Whereas vaccine acceptance represent a willingness to be inoculated, its hesitancy represents a motivational state of being conflicted or opposed to vaccination.[12] In addition, refusal to accept COVID-19 vaccine is prevalent in low-income and high-income counties alike. It has been reported to be experienced across various groups with varied ethnic, religious and socio-economic diversity.[13] Common reasons for refusal to accept the COVID-19 vaccines include fear about the safety and effectiveness; disinformation on social media; fears resulting from the speed with which the COVID-19 vaccines went through clinical trials and fears about the new forms of mRNA vaccines.[6, 12] This survey aimed to assess the willingness to accept COVID-19 vaccine among anaesthetists in Nigeria.

METHODOLOGY

This descriptive cross-sectional study was carried out amongst anaesthetists in tertiary institutions in Nigeria from March 25 to August 13, 2021. The country covers a landmass of 923,768 square kilometres and has 36 states and a Federal Capital Territory. Nigeria has a projected population of 195,000,000 people; based on the 2006 national population census and an annual growth rate of

2.38%. [14] There are 3,534 hospitals in Nigeria. These include both the public and private hospitals; 950 public sector institutions and the 54 tertiary hospitals. The 54 tertiary hospitals also comprise 20 teaching hospitals, 22 federal medical centers, 3 national orthopedic hospitals, the National Eye Center, the National ENT center and 7 psychiatric hospitals. These tertiary institutions currently have 221 Anaesthetists; given a ratio of 0.001 Anaesthetist per 1000 population, which is very low.[15]

The study participants were members of the Nigeria Society of Anaesthetists, who worked in various tertiary institutions in Nigeria within the study period. This was a total population (221) study that included all anaesthetists, who belonged to the Nigeria Society of Anaesthetists.[16]

The questionnaires were administered to the respondents at the various tertiary institutions in Nigeria through physical means (hard copy) or online (via e-mail or whatApp). The questionnaire was developed by the researchers for this study after a review of previous literatures,[7, 17, 18] and WHO guidelines.[19] Data were collected between 28 April and 10 May, 2021 using self-administered questionnaires. The questionnaires contained questions on socio-demographic characteristics; knowledge of COVID -19 disease, the vaccines and willingness of respondents to accept the vaccines. The socio-demographic information collected included age, gender, geographical region of origin, marital status, religion, place of work, rank and period of employment (job duration).

Respondents' knowledge of COVID-19 disease was assessed using three (3) questions. These questions included a question on awareness of COVID-19 disease; with a Yes or No response. This was closely followed by a question on knowledge of the disease; particularly on the preventive measures for the disease; which had multiple responses. There was also a question on whether anaesthetists were at higher risks of contracting the disease. Each correct response was awarded a score of two (2), with a maximum score of 6. The total score for each respondent was converted to percentage and classified as: Poor knowledge (less than 50%); Fair knowledge (50-69.9%) and good knowledge (70% and above). Willingness accept the vaccine was assessed using one question; which asked if they were willing to take the vaccine with a "yes" or "no" response.

Data was screened for completeness, coded and entered into the IBM SPSS version 21.0. Chi-square statistical test of significance as well as Fisher's exact test were used to test for association between the socio-demographic variables and the respondents' willingness to accept COVID vaccine. Multivariate analysis model was also used to identify predictors of COVID-19 vaccine acceptance among the respondents. Statistical significance was set at $p < 0.05$. Ethical approval for the study (ISTH/HRRC/20220606) was obtained from the Ethics and Research Committee of Irrua Specialist Teaching Hospital, Irrua and individual consent was obtained from the respondents before participating in the study.

RESULTS

A total of 195 completed questionnaires were returned out of the 221 that were distributed, giving a response rate of 88.2%. Their age ranged from 23 to 69 years; with a median and an inter-

Table 1: Socio-demographic characteristics of respondents

Variables	Frequency (n=195)	Percent
Age (years)		
20-29	10	5.1
30-39	76	39.0
40-49	76	39.0
50-59	24	12.3
60-6	9	4.6
Mean (SD)	41 (8.5)	
Sex		
Male	112	57.4
Female	83	42.6
Marital Status		
Single	32	16.4
Married	160	82.0
Widowed	2	1.0
Divorced	1	0.5
Geo-political zones		
North Central	46	23.6
North East	4	2.0
North West	10	5.1
South East	27	13.8
South South	46	23.6
South West	62	31.8
Religion		
Christianity	175	89.7
Islam	19	9.7
Eckanckar	1	0.5
Duration on job (years)		
Greater than 3 years	68	34.9
Three years or less	127	65.1

Table 2: Participants' knowledge of COVID-19 and its preventive measures

Variable	Frequency (n=195)	Percent
Aware of COVID-19		
Yes	195	100.0
Anaesthetists are among those at higher risk of contracting COVID-19		
Yes	195	100.0
No	0	0.0
Preventive measures for COVID-19*		
Face mask	168	86.1
Physical/Social distancing	160	82.0
Hand hygiene	150	76.2
COVID-19 Vaccination	103	52.8
Respiratory hygiene	68	34.9
Use of other personal protective equipment	58	29.7
Knowledge of COVID-19		
Good	119	61.1
Fair	57	29.2
Poor	19	9.7

**Multiple responses*

Table 3: Respondents' willingness to accept COVID-19 vaccine

Variable	Frequency (n=195)	Percent
Awareness of COVID 19 vaccine		
Yes	195	100
No	0	0
Are you willing to take the vaccine?		
Yes	103	52.8
No	92	47.2
Preference for a particular brand (n=103)		
Yes	55	53.4
No	48	46.6
Would you pay for the vaccine (n=103)		
Yes	34	32.0
No	30	29.1
Uncertain	39	37.9
Reasons for non-acceptance of vaccine (n=92) *		
Potential to kill humans in Africa and conspiracy against developing nations	46	50.0
Lack of storage facility, low efficacy and doubt about the safety	86	92.9
Suspicion of presence of biological hips in vaccine	89	96.4

**Multiple responses*

quartile range of 40.5 and 11.0 years respectively. The majority of the respondents were within the ages of 30-49 years 152 (78.0%). There were more males, 112 (57.4%); most of the respondents were married 160 (82.0%), while majority 175 (89.7%) were Christians. The respondents' geopolitical zone is dominated by Southwest (37.8%), South-south and North central (23.6%) respectively (Table 1).

All the respondents were aware of COVID 19 disease. Majority of them, 119 (61.0%) had a good knowledge of COVID 19 disease while 57 (29.2%) and 19 (9.7%) had fair and poor knowledge, respectively. A greater proportion of the respondents, 168 (86.1%) were aware of the use of facemask as a preventive measure against COVID-19. This was closely followed physical/social distancing, 160 (82.0%). Only 58 (29.7%) respondents stated that the use of personal protective equipment was an important preventive measure against the disease (Table 2).

One hundred and three (53.8%) of the respondents were willing to accept the COVID 19 vaccine. Among those that were willing to accept the vaccine, 55 (53.4%) had preference for a particular brand while 48 (46.5 %) did not have preference for any brand. Among the 92 who were unwilling to accept the vaccine, their reasons for non-acceptance were fear that the vaccine contained biological chips, 89 (96.4%); lack of storage facility; low efficacy; doubt about vaccine safety 86 (92.9%) and fear of taking the vaccine because of the possibility that it was meant to kill Africans 46 (50.0%). (Table 3).

There was a statistically significant difference between the respondents' gender and their willingness to accept COVID-19 vaccine ($p<0.011$), with more males 69 (61.6%) significantly associated with willingness to take the COVID-19 vaccines than the females 34 (42.0%). Although there was no statistically significant association between the age of respondents and their willingness to accept the

Table 4: Association between Acceptance of COVID-19 vaccines and selected characteristics of the respondents

Socio-demographic factors	Yes (%)	No (%)	X^2	p-value
Age (years)				
20-29	6 (60.0)	4 (40.0)	7.0	0.533
30-39	35(46.0)	41 (54.0)		
40-49	47 (61.8)	29 (38.1)		
50-59	11 (45.8)	13 (35.5)		
60-69	4 (44.4)	5 (55.5)		
Sex				
Male	69 (61.6)	43 (38.4)	9.1	0.011
Female	34 (42.0)	49 (59.0)		
Marital status				
Single	13 (40.6)	19 (59.4)	6.6	0.359
Married	88 (42.0)	72 (45.0)		
Divorced	1 (100.0)	0 (0.0)		
Window	1 (50.0)	1 (50.0)		
Geopolitical zone				
North-Central	19 (41.3)	27 (58.6)	14.7	0.144
North-East	2 (50.0)	2 (50.0)		
North-West	5 (50.0)	5 (50.0)		
South-East	13 (48.1)	14 (51.8)		
South-South	23 (50.0)	23 (50.0)		
South-West	41 (66.1)	21 (33.9)		
Religion				
Christianity	89 (50.9)	86 (49.1)	5.0	0.291
Islam	13 (68.4)	6 (31.6)		
Eckankar	1 (100.0)	0 (0.0)		
Knowledge of COVID-19				
Good	77 (64.7)	42 (35.3)	18.68	<0.001
Fair	18 (31.6)	39 (68.4)		
Poor	8 (42.1)	11 (57.9)		

**Statistically significant*

Table 5: Unadjusted and adjusted regression analysis of predictors of acceptance of COVID-19 vaccine

Variables	Unadjusted			Adjusted		
	OR	95%CI	p-value	AOR	95%CI	p-value
Sex						
Female	1.00	Ref	Ref	1.00	Ref	Ref
Male	2.31	1.294-4.130	0.005	2.50	1.213-5.246	0.013
Religion						
Christianity	1.00	Ref	Ref	1.00	Ref	Ref
Eckankar	1.00			1.00		
Islam	2.09	0.761-5.758	0.152	3.30	0.691-16.192	0.133
Geopolitical zone						
North-central	1.00	Ref	Ref	1.00	Ref	Ref
North-east	1.42	0.183-10.994	0.736	1.90	0.105-33.631	0.677
North-west	1.42	0.360-5.600	0.616	0.32	0.060-3.558	0.289
South-east	1.32	0.507-3.433	0.570	3.43	0.999-10.277	0.038
South-south	1.42	0.623-3.238	0.403	3.26	1.151-9.129	0.030
South-west	2.77	1.261-6.101	0.011	3.13	1.353-8.651	0.020
Knowledge of COVID-19						
Fair	1.00	Ref	Ref	1.00	Ref	Ref
Good	13.74	6.064-31.115	<0.001	14.91	6.114-36.359	<0.001
Poor	4.36	1.405-13.544	0.011	4.80	1.483-16.113	0.009

COVID-19 vaccine (p<0.533), respondents within the 40-49 years age group were more willing to accept the vaccines. In addition, there was a statistically significant association between the respondents 'willingness to accept the COVID-19 vaccine and their knowledge of the disease (p<0.0001); where those with good knowledge showed significantly higher willingness to accept the vaccine (Table 4).

Table 5 reveals logistic regression model showing the predictors of COVID-19 vaccine acceptance among the respondents. Males were 2.5 more likely to accept COVID-19 vaccines than females: (AOR=2.5, 95% CI=1.213 - 5.246, p=0.013). Acceptance of COVID 19 vaccine among the respondents was more likely among respondents from the South west geopolitical zone (AOR=3.134, 95% CI=1.353 - 8.651, p=0.020); South south geopolitical zone (AOR=3.264, 95% CI=1.151 - 9.129, p=0.030); South east geopolitical zone (AOR=3.438, 95%CI=0.999 - 10.227, p=0.038) than the other geopolitical zones. There was also greater likelihood to accept COVID-19 vaccines among those with good knowledge of the vaccine (AOR=14.910, 95% CI=6.114 - 36.359, p<0.001).

DISCUSSION

This survey assessed the willingness to accept COVID-19 vaccine among anaesthetists in Nigeria. The respondents were all aware of COVID-19 disease and about two-thirds of them had a good knowledge of the disease.

This finding was further underscored by the fact that over four fifth of the respondents stated correctly identified some notable preventive measures against the disease; which included face mask and physical/social distance. The use of face mask has indeed been documented to be particularly effective in the reduction of transmission of COVID-19 disease, especially among health workers.[20] Moreover, their responses were not unexpected because all the respondents were specialist health care professionals who were conversant with diseases by virtue of their trainings. COVID-19 disease, which assumed a pandemic proportion in March 2020, is a relatively a new disease but the health care professionals are better poised to grasp the epidemiology of the disease.[1, 2] It is therefore expected that these health care professionals should take adequate preventive steps within and outside their work environment and also pass the correct information on COVID-19 to the larger society; since they remain a veritable source of health information to the public, especially during disease outbreaks.[7] However, about a quarter of the respondents had Fair and Poor knowledge about the disease. Findings from this study on knowledge of the disease was slightly higher than the result from a previous study in Dubai, [7] where 57.0% of the respondents had a good knowledge of COVID-19 disease. These differences may be related to the differences in skills of the respondents. Whereas the respondents in this study are top health care professionals, the participants in the Dubai study were a combination of all categories of health workers. The findings on knowledge of COVID-19, in this study is also consistent with a previous report from Saudi Arabia,[7] in which up to 82% of the respondents were aware and adhered to hospital preventive measures.

In terms of willingness to accept COVID-19 vaccine, slightly over half of the respondents in this study were willing to accept the COVID-19 vaccine. This was not significantly different from previous reports from Uganda and Ethiopia,[7, 17] in which 53.6% and 48.4% of the respondents respectively were willing to accept the vaccine. It is also slightly lower than the result obtained from another study in South Africa[7]; where 59.0% of the respondents would accept the vaccine. However, it was at variance with reports from Turkey,[7] in which 84.6% of the health care professionals were desirous of accepting COVID-19 vaccine. This disparity reveals some knowledge gap among the respondents; which requires urgent attention. However, slightly less than half of the respondents were not willing to accept the COVID-19 vaccine. This position may have resulted from the overwhelming misleading information about the disease on various communication channels; especially the social media. The social media is indeed particularly replete with unsubstantiated information on the disease. On the other hand, the result obtained from this study is incongruous with reports from South Africa and Uganda[7, 21] where 41.0% of the respondents were vaccine hesitant and 46.4% were unlikely to accept the COVID-19 vaccine respectively. Furthermore, over four fifth of those not willing to accept the vaccine stated that they were scared of taking the vaccine because of the possibility that they contained biological chips meant to track humans. Moreover, majority of the respondents also expressed their doubts over the efficacy of the vaccine. This was incongruous with an observation by researchers from Uganda,[13] only one-fifth of the respondents had no confidence in the efficacy of COVID-19 vaccine. The level of trust of individuals on the efficacy of the COVID-19 vaccines have been reported to influence its acceptance (or vaccine hesitancy).[13]

With regard to predictors of willingness to accept the vaccine, males were more likely to accept COVID-19 vaccines than females. This characteristic is consistent with previous reports from a systematic review and meta-analysis,[22] in which 58% of the papers reviewed reported that men had higher intentions to get vaccinated with COVID-19 vaccines; which was particularly more among the health workers than the general population.[22] This finding is also in keeping with results from Turkey and Saudi Arabia,[21, 23] but at variance with previous reports from some African countries.[7, 24] As regards the age of most of the respondents that were willing to accept the COVID-19 vaccine, the highest proportion of them were within the ages of 40-49 years. This is comparable to what was obtained from a previous study carried out among health care workers in Turkey.[21] This represents the most active age group of specialist professionals in health institutions of public service.

Nonetheless, the acceptance of COVID-19 vaccine was more likely among respondents from the South- west geopolitical zone, South-south geopolitical zone, and South-east geopolitical zone compared to other geopolitical zones. This observation is not surprising, considering the predominant effect of vaccine hesitancy, irrespective of formal education, which had previously been documented in the northern region of Nigeria.[18] The higher literacy (and its equivalent general health awareness) level among people

from the South-western zone of the country may also have had an overriding effect on respondents from the zone.[24] This is comparable to a report from South Africa[7] in which healthcare workers who had more tertiary education and students were more likely to accept the COVID-19 vaccine. Furthermore, there was also a higher likelihood to accept COVID-19 vaccines among those with good knowledge of the vaccine compared to those with fair and poor knowledge of the disease. This finding reveals the usefulness of information and knowledge of disease in decision making on the acceptance of the recommended treatment by clients. It is consistent with results obtained from Malaysia and China.[7]

In conclusion, slightly over half of the respondents were willing to accept COVID-19 irrespective of their generally good knowledge of the disease. Common predictors of willingness to accept the vaccine include the male sex, geopolitical zones in the country and knowledge of the disease. There is an urgent need for tertiary health institutions in Nigeria to sensitize health care professionals especially the females on the need to accept the COVID-19 vaccine. This could be successfully implemented through the various female branches of the health care providers associations such as the Medical Women Association of Nigeria.

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