Original Research Article

COVID-19 VACCINE HESITANCY AMONG MEDICAL DOCTORS AT A TERTIARY HEALTH CARE FACILITY IN THE NIGER-DELTA OF NIGERIA

ABSTRACT

Background: One of the pillars of prevention is COVID-19 vaccination. Nonetheless, there are lots of skepticism in taking the vaccine in the populace even among health workers especially as it relates to the safety profile of the vaccine.Generally, the populace look up to the medical doctor for advice, therefore hesitancy amongst doctors to the vaccineuse may translate to hesitancy among the population.

Aim: Toassess COVID-19 vaccine hesitancy, identify factors militating against vaccine uptake and the reasons for taking the vaccine among medical practitioners at the Niger Delta University Teaching Hospital, Okolobiri, Bayelsa state, Nigeria.

Study design: This was a descriptive cross-sectional study.

Place and duration of Study: This was a study carried out among medical doctors at the Niger Delta University Teaching Hospital, Okolobiri, Bayelsa state, Nigeria, between June and July, 2021.

Methodology: Questionnaires were used to obtain data from 102 participants recruited by consecutive sampling. The questionnaires contained the socio-demographic, medical history of the respondents, factors militating against COVID-19 vaccine uptake and the reasons for taking the vaccine.

RESULT: A total of 102 medical doctors participated in the survey. COVID-19 vaccine hesitancy was as high as 70.6% among the participants. The commonest reason for not accepting the vaccine was that the vaccine had not undergone sufficient clinical trial (40.3%). The most common reason for accepting the vaccine among vaccinated participants wasto have a travel pass to other countries (73.3 %).

CONCLUSION:COVID-19 vaccinehesitancy is very high among medical practitioners from this study. The novelty of the disease and the speed of vaccine development leaves a doubt about whether the vaccine has undergone sufficient clinical trial and on the safety of the vaccine. Doctors who intend to emigrate for better career opportunities dominate vaccine acceptors from this study.

KEYWORDS: *COVID-19, Vaccine, Hesitancy, Medical practitioners*

INTRODUCTION

COVID-19 pandemic which started in Wuhan China late December 2019, shocked the world and threatened human existence.[1] The WHO soon after declared COVID-19 a disease of public importance.[2]

The pandemic has cost the lives of millions, caused loss of jobs, untold mental and socio-economic distress.[2] No nation of the world has been spared of its harrows.[2] Thus preventive measures sprang up to

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curb the disease and this included social distancing, avoidance of social gathering, hand hygiene and COVID-19 vaccination.[3]

The first COVID-19 vaccine was the CanSino Vaccine produced in China, and approved on 24 June 2020 for limited use in the Chinese military.[4] On 11th August 2020, Russia announced the approval for its Sputnik V Vaccine for emergency use.[5] Other vaccines have since been validated for emergency use by the WHO. In Nigeria, the COVID-19 vaccine was first administered to essential workers (health workers, teachers and military).[6] In early March of 2021, it was announced that Nigeria had received 2.94 million COVID-19 vaccines shipped by Vaccines Global Access Facility – COVAX. The vaccines are the Oxford/AstraZeneca Vaccines produced in India.[7]

Despite this laudable effort by donors and government to provide COVID-19 vaccines, pockets of hesitancy to taking the vaccine have been noticed globally even amongst health workers.[1]Vaccine hesitancy which is defined as delay in accepting or outright refusal of vaccination despite availability of vaccination service, is a global phenomenon and a chronic public health threat and it is not peculiar to COVID-19 vaccination.[8]

COVID-19 vaccine hesitancy among health workers is well noted from various studies and it has not been impressive.[1,2,9]The reasons for such hesitancy borders mainly about COVID-19 vaccine safety profile.[1,2,9,10]

COVID-19 vaccination among medical doctors is vital, as they are in recommendatory positions to their patients and the public at large.[2] Thus hesitancy towards COVID-19 vaccine among medical doctors may impact hugely on populace vaccine reception.

A necessity for this study was borne out of a previous observation from a similar study done at a sister tertiary health care facility in Bayelsa state, where a COVID-19 vaccine uptake rate of 27.4% was reported.[10] This studyaimed toassess COVID-19 vaccine hesitancy, identify factors militating against vaccine uptake and the reasons for taking the vaccine among medical practitioners at the Niger Delta University Teaching Hospital, Okolobiri, Bayelsa state, Nigeria.

METHODOLOGY

It was a descriptive cross-sectional study carried out among medical doctors at the Niger Delta University Teaching Hospital (NDUTH), Okolobiri, Bayelsa State, Nigeria, between 15thJune and 30thJuly, 2021. The hospital is located 0.69 km from Yenagoa; the state capital, and serves as a teaching hospital for the Niger Delta University. The NDUTH together with the Federal Medical Centre, Yenagoa, are the two tertiary hospitals in the state and both serve as referral hospitals for primary, secondary and private health care facilities in the state and in the neighboring states of Delta and Rivers, Nigeria.There are approximately 154 medical doctors working at the NDUTH.

Employing the formula for calculating sample size in cross-sectional studies[11] and relying on a prevalence of COVID-19 vaccination among health workers of 27.4% from another study in Yenagoa,[10] a sample size of 102 was derived for this study after adjusting for an anticipated non-response rate of 30%. The sample size was be calculated using

$$n = \frac{pq}{(\frac{d}{1.96})^2}$$ [11]

Where n = sample size

p = working prevalence rate

q = 100 – p.

Prevalence rate Health Workers who took the of COVID-19 vaccine from a similar study [10]= 27.4 %.

d = margin of sampling error tolerated at 95% confidence interval = 10 %

Adjusting for attrition rate of 30%

30% attrition = $(^{30}/_{100})$ 76.4

:. Adjusted sample size = 76.4 + 22.9≅ 100

Working sample size = 100 medical doctors.

A semi-structured questionnaire was used to obtain data from 102 participants by consecutive sampling. The questionnaire contained 12 items. Items 1 to 5 addressed the socio-demographic and medical history of the respondents and the other items address factors militating against COVID-19 vaccine uptake and the reasons for taking the vaccine.

DATA ANALYSIS

The data was analyzed using the SPSS Windows Version 25.0. Categorical variables were expressed in frequencies and percentages and presented using tables and a chart. A bivariate analysis was done to determine association between COVID-19 vaccine hesitancy, socio-demographic characteristics and presence of chronic medical conditions. Statistical significance was set at *P*-value of <.05.

RESULTS

Socio-demographic characteristics of participants

A total of one hundred and two medical doctors from the Niger Delta University Teaching Hospital participated in the survey. Of the 102 participants, about three-fifths were males (62.7%) while females were 37.3%, see Table1. Most of the respondents (44.1%) were aged 30 - 39 years see Table 1. Majority of the participants were single (62.7%) and Christians by religion (93.1%).

Chronic medical conditions among participants

Seventeen participants (16.7%) had chronic non-communicable diseases (NCD). The NCDs included hypertension (11.8%), diabetes mellitus (2.9%) and asthma (2.9%). Others (2.9%) reported were chronic inflammatory synovitis and rheumatoid arthritis (Table 2).

Table 1: Socio-demographic characteristics of participants

Characteristics	Frequency N = 102	Percent (%)
Sex		
Male	64	62.7
Female	38	37.3
Age group		
20 - 29 years	39	38.2
30 - 39 years	45	44.1

40 - 49 years	12	11.8
> 50 years	6	5.9
Marital Status		
Single	64	62.7
Married	38	37.3
Religion		
Christian	95	93.1
Others*	7	6.9

*Others include Islam, African Traditional religion and El kankar

Table 2: Chronic medical conditions among participants

Characteristics	Frequency N = 102	Percent (%)
Chronic medical condition		
No chronic medical condition	85	83.3
Chronic medical condition present	17	16.7
Type of chronic medical condition		
Hypertension	12	11.8
Diabetes	3	2.9
Asthma	3	2.9
Sickle Cell Disease	1	1.0
Others*	3	2.9

COVID 19 Vaccinehesitancy,factors militating against COVID-19 vaccine uptake and the reasons for taking the vaccine

As high as 70.6% of medical doctors in the study refused to take the vaccinewhen it was made available to health workersat the hospital (Figure 1). Of the 72 participants who did not take the vaccine, the most attributed reasons for hesitation included that the vaccine has not gone through sufficient clinical trial (40.3%), the vaccine has fearful side effects (23.6%) and the vaccine is not safe (18.1%). Two medical doctors did not take the vaccine because they have been infected by COVID 19 virus in the past (Table 3).

Among the 30 participants (20.4%) that took the vaccine, travelling out of the country was the most common reason for taking the vaccine (73.3%). Other reasons includedprotecting self and family (53.3%) and the fear that the vaccine may not be available later (43.3%), see Table 4.

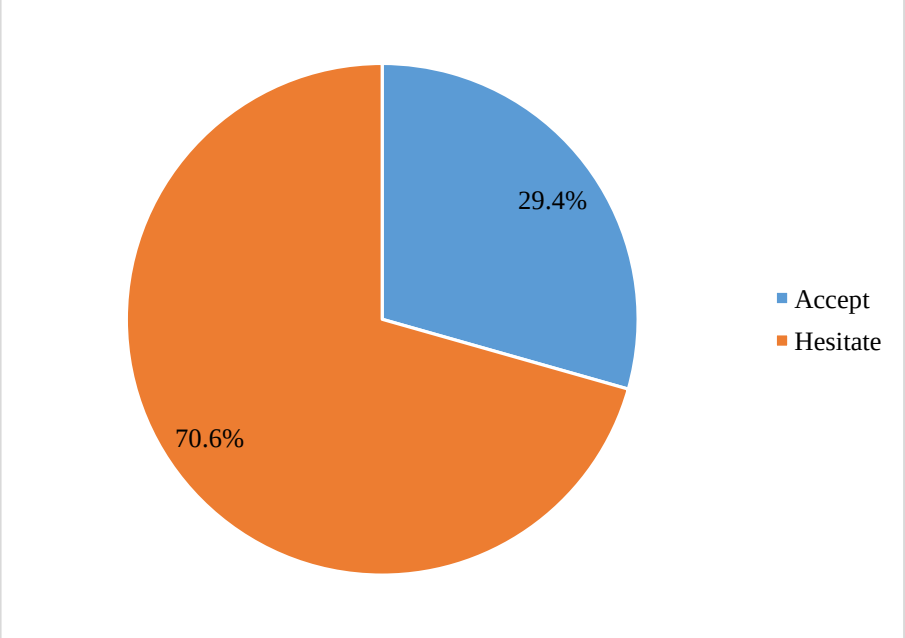

Figure 1: Vaccine hesitancy among Participants

Table 3: Reasons for COVID-19 vaccine hesitancy among medical doctors at the NDUTH, Okolobiri

Reasons	Frequency N = 72	Percent (%)

The vaccine has not undergone sufficient trial	29	40.3
The vaccine has fearful side effects	17	23.6
The vaccine is not safe	13	18.1
I have medical conditions	7	9.7
I want to see what happens to those vaccinated before	6	8.3
I need approval of family and friends	4	5.6
The vaccine in Africa currently is substandard	4	5.6
The vaccine we have in Africa is less efficacious	3	4.2
There are other forms of treatment for COVID19	3	4.2
I have had COVID-19 before	2	2.8
I am pregnant	2	2.8
Other reasons	4	5.6

*Other reasons included that Astra Zeneca vaccine is inferior to other COVID vaccines available in other parts of the world, that herd immunity is produced when others take the vaccine so everybody does not have to take the vaccine.

Table 4: Reasons for accepting COVID-19 vaccine among medical doctors at the NDUTH, Okolobiri

Characteristics	**Frequency N = 30**	**Percent (%)**
Travelling to other countries	22	73.3
Personal and family protection	16	53.3
The vaccine may not be available later	13	43.3
The vaccine may have financial cost in the future	6	20.0
It is needed before full work resumption	5	16.7
Development of immunity against the virus	5	16.7

Other doctors are taking it	2	6.7

Association between COVID-19 vaccine hesitancy, socio-demographic characteristics and presence of chronic medical conditions

There was no association between COVID-19 vaccine hesitancy, socio-demographic characteristics and presence of chronic medical conditions. Although there was an obvious difference in the proportion of male medical doctors who took the vaccine compared to those who refused, this was not statistically significant (X^2 = 3.52; *P* = .06).The proportions show that male medical doctors are more likely to take the vaccine than their female counterpart(Table 5).

Table 5: Association between COVID-19 vaccine hesitancy, socio-demographic characteristics and presence of chronic medical conditions among medical doctors at the NDUTH, Okolobiri.

Characteristics	**Total N = 102 (%)**	**COVID 19 Vaccine**		**Chi square**	***P*-value**
		Accepted N = 30 (%)	**Hesitated N = 72 (%)**		
Gender					
Male	64(62.7)	23(76.7)	41(56.9)	3.524	.06
Female	38(37.3)	7(23.3)	31(43.1)		
Age group					
20 - 29 years	39 (38.2)	8(26.7)	31(38.2)	6.854	.08
30 - 39 years	45 (44.1)	14(46.7)	31(43.1)		
40 - 49 years	12 (11.8)	7(23.3)	5(6.9)		
> 50 years	6 (5.9)	1 (3.3)	5 (6.9)		
Marital Status					
Single	64(62.7)	17(56.7)	47(65.3)	0.672	.41
Married	38(37.3)	13(43.3)	25(34.7)		
Religion					
Christian	95(93.1)	26(86.7)	69(95.8)	2.784	.09

Others	7(6.9)	4(13.3)	3(4.2)		
Chronic medical condition					
Present	85(83.3)	27(90.0)	58(80.6)	1.350	.24
Absent	17(16.7)	3(10.0)	14(19.4)		
Hypertension					
Yes	12(11.8)	2(6.7)	10(13.9)	1.064	.30
No	90(88.2)	28(93.3)	62(86.1)		
Diabetes					
Yes	3(2.9)	0(0.0)	3(4.2)	1.288	.26
No	99(97.1)	30(100.0)	69(95.8)		
Asthma					
Yes	3(2.9)	0(0.0%)	3(4.2)	1.288	.26
No	99(97.1)	30(100.0)	69(95.8)		
Sickle Cell Disease					
Yes	1(1.0)	0 (0.0)	1(1.4%)	0.421	.52
No	101(99.0)	30(100.0)	71(98.6)		

DISCUSSION

COVID-19 has devastating effects on various systems of the human body especially the lungs. For now, there is no proven or effective drug for its treatment however its prevention has been emphasized. One of the pillars of prevention is COVID-19 vaccination. Nonetheless there are lots of skepticism in taking the vaccine in the populace even among health workers especially as it relates to the safety profile of the vaccine.

Vaccine hesitancy has been recorded in the practice of medicine since preventive medicine became a pillar of health care delivery. Despite the benefits from the use of vaccine, there is a reluctance to accept vaccination from time immemorial.[12]

Male constituted slightly above three-fifth of the study participants. A plausible explanation for this may be this may be due to a higher male to female ratio doctors in the hospital.

In this study about eight out of ten study respondents were 39 years and less. This may be due to the fact that most of medical doctors aged 40 years and above were in the senior medical officer/consultant cadre, and thus, are not always present in the hospital environment, except when they are on duty or when their input are needed in patients' care.

Most of the respondents in this study were Christians. The reason for this was that the study was carried out in a Christian dominated environment. The Islamic faith, which is the commonest religion, is most predominant in the middle belt and Northern part of Nigeria. Other religious faiths constitute a minority in all parts of the country.

From this study vaccine hesitancy was markedly high. This finding is incongruous with the finding from a similar study conducted at the University Hospital in Turkey, where it was reported that 91% of medical doctors have been vaccinated.[13] This dissimilarity may be explained by a negative perception of the COVID-19 vaccine in Nigeria and perhaps in the rest of Africa.This perception is fueled byconspiracy theories that casts aspersions on the intentions of the vaccine manufacturers and questions the safety of the vaccine.Some people believe that the COVID-19 is a scheme by the developed world to depopulate Africa while some others believe that Africans are being used as 'guinea pigs' to be experimented on with the various available 'hurriedly manufactured' vaccines.[14,15,16] If this negative perception persists, in the long run developing countries may be pockets or reservoirs for COVID-19 infection, thus putting the rest of the world in perpetual exposure to the infection. This may lead to economic, financial and travel restrictions between the underdeveloped and developed nations.

A good number of respondents (80%) in this study refused COVID-19 vaccination for the reason that the vaccine had not been subjected to sufficient clinical trials, and also for fear of side effects fromthe vaccine.In a similar study by Yadav et al, in India, 40.3% of the respondentsexpressed fear about the COVID-19 vaccines, although the exact cause of the fears were not reported.[17] This significant disparity between this study and that of the Yadav's study may be due to more enlightenment about the vaccine amongst respondents in the later study. Many medical doctors of African descent, may still belief the conspiracy theory that Africans are been experimented on, with the various armamentarium of COVID-19 vaccines available. This too may account for the high refusal to be vaccinated against COVID-19. The number of COVID-19 related deaths as carried on social media and other news outlet, depicting more of such deaths in non-tropical countries than tropical countries may also have been contributory.

This incongruity in the level of acceptance of the COVID-19 vaccine in this study was also seen when the finding in this study was compared to a similar study by Sirikalyanpaiboon et al, in Thailand, where slightly above one fifth of the participants (21.4%), who were also physicians, are not willing to be vaccinated.[18]This buttresses the fact the earlier assumption made about medical doctors practicing in a tropical country. However, in Sirikalyanpaiboon et al's study, uncertainty about the COVID-19 vaccine (83.9%), followed by fear of the vaccine adverse outcome (48.4%) were the major factors for vaccine hesitancy as was also noticed in the findings of this study.

All the same, it is only natural to be hesitant when a new vaccine is introduced in a population, as seen in the case with the influenza vaccine.[19]

This study found that the commonest reason for accepting COVID-19 vaccine among the vaccinated respondents was to have a travel pass to other countries. Medical professionals have been noticed to be highly migratory, especially those in less developed climes in a bid to look for greener pastures, that is, better working conditions and remunerations.[20,21]COVID-19 pandemic had caused travel restrictions between countries. This travel bans were imposed to

cut off the transmigration of COVID-19 infections. Evidence of vaccination through the sighting of the vaccination card at entry points was the norm in many countries. This trend encouraged the uptake of the vaccines by those who intend to leave the shores of their countries for a better life. However, rumours of falsification of COVID-19 vaccination data/card in some countries, especially the underdeveloped countries have made rounds in the social media.[22-24]Since the emergence of the COVID-19 pandemic and different protocols at various international airports in Nigeria, there had been allegations of test result falsification carried out in connivance with travel agents.[25] Because of this, some countries such as the United Arab Emirate introduced COVID-19 rapid antigen testing for persons migrating into their countries.[25]In other words, covid-19 vaccination certificates/card and test results from developing countries such as Nigeria were subjected to international scrutiny. Particularly, this action had triggered diplomatic row between Nigeria and developed countries.[25] However, issuance of fake COVID-19 results is not peculiar to Nigeria. Nonetheless, the federal government of Nigeria have put in place several measures such as the generation of a bar code after payment for the COVID-19 PCR testand empowering law enforcement agencies especially the secret service, to investigate and prosecute unscrupulous persons procuring vaccination cards without receiving the vaccine, all in a bid to prevent this dastard act.[25]

Other reasons for taking the COVID-19 vaccine amongst the respondents were for personal and family protection and that the vaccine may not be availablein the country in the near future. However, the government of Nigeria has assured continued availability of the vaccine in the country.[26] In fact, in Nigeria, there are currently stockpiles of out-of-date COVID-19 vaccines which has gone unused. This is may be a testament to COVID-19 vaccine hesitancy in the country as a whole, amongst a host of other reasons.[27]

CONCLUSION

The fact that the COVID-19 infection which has transcended nearly all nations is yet to be subdued can be traced to widespread non-vaccination across countries, especially in third world countries.[27]From this study, COVID-19 vaccine hesitancy was remarkably high among medical doctors. The most attributed reasons for hesitation included that the vaccine has not gone through sufficient clinical trial, the vaccine has fearful side effects and the vaccine is not safe. Not being limited by evidence of COVID-19 vaccination when travelling out of the country was the most common reason for taking the vaccine. Other reasons included to protect self and family and the fear that the vaccine may not be available later.

At the time of this study, uncertainties and conspiracy theories about the COVID-19 vaccine rather than knowledge was the main driver of the uptake or rejection of COVID-19 vaccine among medical doctors especially of African descent. Medical doctors are the top echelon of the medical profession and as patients look up to medical professionals; especially their doctors for advice and guidance on matters concerning their health, it is possible to infer the findings of this study to the general population. Hence it will be somewhat expected to find that a large proportion of the public in developing countries will reject vaccination.

RECOMMENDATIONS

COVID-19 vaccination is still the key to ending the pandemic. Education about the COVID-19 vaccine is vital. COVID-19 vaccines makers owe it as a responsibility to the general population to dispel myths associated with the vaccine. These interventions will shoot up COVID-19 vaccine uptake,including amongmedical doctors and allied health care workers who are better positioned to advice their patients and by extension the public on the vaccines.

An assumption that medical doctors should have complete knowledge of the COVID-19 vaccine, its efficacy and side effects is faulty, especially as COVID-19 is still an emerging infectious disease. To increase the uptake of the vaccine among medical practitioners, continuing medical education programs centered on COVID-19 vaccination should be intensified. Hospital ground rounds and medical conferences should be utilized as educational avenues by COVID-19 vaccine manufacturing company representatives.

COMPETING INTERESTS DISCLAIMER

The authors have declared that no competing interest exist. There is absolutely no conflict of interest between the authors and the producers of any of the COVID-19 vaccines used by respondents in this study, because we don't intend to use the findings of this study as a source of litigation, but for the advancement of knowledge. The research was not funded by any COVID-19 vaccine producing company rather it was funded by the personal efforts of the authors.

ETHICAL APPROVAL

This was obtained from theResearch and Ethics Committee of the Niger Delta University Teaching Hospital, Okolobiri, Bayelsa. Consent to participate in this study was gotten from the study respondents.

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Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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