

Original Article

Assessment of Covid-19 Knowledge Vaccination Status and Willingness to Recommend Covid-19 Vaccine Among Final Year Medical Students in Southeast Nigeria

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ABSTRACT

Vaccines are the most crucial tool to end COVID-19 pandemic and save lives and livelihoods. Healthcare workers are at risk of contracting and transmitting COVID-19 disease. This study aimed to assess the COVID-19 disease knowledge, vaccination status, willingness to recommend the COVID-19 vaccine, and associated factors among final-year medical students in a tertiary healthcare facility in Imo, Nigeria. This was a cross-sectional study and data was collected using a pre-tested semi-structured self-administered questionnaire. Descriptive and bivariate analysis were performed using SPSS statistical software version 22.0, and the level of statistical significance was determined at a P-value of less than 0.05. Majority of the respondents (82.5%) had a good knowledge of COVID-19 infection. Less than half of the medical students (44.2%) had received at least a dose of COVID-19 vaccine and a higher proportion of the respondents (55.2%), reported fear of side effects as a barrier. Having a relative who had received COVID-19 vaccine was significantly associated with both respondents' vaccination status and the respondent's willingness to recommend the COVID-19 vaccine. Though majority had good knowledge, less than half of the medical students had received COVID-19 vaccine. Therefore, efforts should be made by the relevant authorities towards ensuring that information regarding COVID-19 vaccine safety is disseminated to the students.

Keywords: COVID-19 vaccination status, Knowledge, Medical students, Southeast Nigeria

INTRODUCTION

The coronavirus disease-2019 is a novel disease caused by the zoonotic respiratory virus, the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) (COVID-19). The disease was declared a pandemic by the World Health Organization (WHO) on 11th March 2020.¹ Worldwide, as of September 2022, there have been 610,393,563 confirmed cases of COVID-19,

including 6,508,521 deaths, reported to World Health Organization (WHO), and a total of 12,640,866,343 vaccine doses have been administered.² Vaccination is the most cost-effective way to prevent disease and vaccines are the most crucial tool to end the pandemic and save lives and livelihoods.^{3,4} WHO has labelled vaccine hesitancy, the reluctance or refusal to vaccinate despite the

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availability of vaccines, as one of the top ten global threats.³ In low-income and middle-income countries (LMICs), the low COVID-19 vaccine coverage is mostly a result of vaccine hesitancy driven by misinformation and disinformation.^{5,6}

The vaccine acceptance rate among adults across the country's six geopolitical zones in Nigeria ranged from 20.0% to 58.2%.⁷ At the present rate, Nigeria might not be able to reach her vaccination target thus, the epidemic will persist and which in turn will worsen the poor morbidity and mortality indices.⁷ The main goals of COVID-19 vaccination are to reduce hospitalization, severe disease outcomes for all variants, and death and to protect health systems.⁸ Studies have shown that healthcare workers (HCWs) are more likely to contract COVID-19 disease and subsequently transmit the disease than the general population.^{9,10,11}

They are also more likely to suffer severe COVID-19 disease.^{9,10} A study has shown that there is prevailing vaccine hesitancy among healthcare workers who are most susceptible to COVID-19 infections, therefore, this should be a cause for concern.⁶ This was supported by a review that found a generally low acceptance of the COVID-19 vaccine among HCWs across Africa.¹² Studies done among medical students in Uganda and Central Asia also reported low COVID-19 vaccine acceptability.^{13,14} The main reasons for vaccine hesitancy noted in these studies were the vaccine's side effects, safety, efficacy, and effectiveness, short duration of the clinical trials, limited information, and social trust^{12,14} and lack of knowledge about the COVID-19 vaccine.¹⁵

Medical students especially those in their final year mostly encounter patients during their clinical postings and are actively involved in patient care management. Occasionally, they have been assigned to assist during COVID-19 emergencies.¹⁶ Furthermore, to increase vaccination uptake among the general population and other healthcare workers, medical students are fundamental to raising public awareness and improving vaccination education.¹⁵ Therefore, this study aimed to assess the COVID-19 disease

knowledge, vaccination status, willingness to recommend the COVID-19 vaccine, and associated factors among final-year medical students in a tertiary healthcare facility in Imo State, Nigeria.

MATERIALS AND METHODS

Study Setting

The study was conducted at the Federal Medical Centre (FMC), Owerri, Imo State, Nigeria. Imo State is located in the South-East geopolitical zone of Nigeria and has 27 Local Government Areas (LGAs) with Owerri city as the capital. FMC Owerri is a public tertiary health facility in Imo state that offers a wide range of preventive and clinical services. It is also an approved health facility where final-year medical students from Madonna university undergo their rotational clinical postings.

Study Design And Population

This was a hospital-based cross-sectional study done between January- March 2022 among final-year medical students of Madonna University Elele, Rivers state undergoing their clinical posting at FMC Owerri.

Sample Size Determination

This was a total population study of all final-year medical students undergoing clinical posting in the different departments at the time of the study. All 120 students participated in the study.

Data Collection

Data were collected by the researchers using a pre-tested semi-structured self-administered questionnaire that was adapted after reviewing relevant pieces of literature regarding COVID-19 knowledge and vaccine hesitancy among medical students and healthcare workers.^{14,18,19}

It consisted of 14 questions grouped into two sections. The first included sociodemographic information while the second section contained items aimed to test respondents' knowledge of COVID-19 infection and explored respondents' and their relatives' screening and vaccination status and barriers to vaccination. In this study, we assessed

willingness to recommend the COVID-19 vaccine by asking the question, "Would you like to recommend the COVID-19 vaccine to others?"

For COVID-19 knowledge scoring, each correct answer was scored "1" while each wrong answer was scored "zero". Respondents' overall knowledge was categorized using *modified Bloom's cut-off point where* scores of < 50% were regarded as poor knowledge, 50-79% were regarded as moderate knowledge, and scores of 80-100% were considered good knowledge. The questionnaire was piloted among 15 medical students in another university to determine its comprehensibility and face validity.

Data Analysis

Data were analyzed using the IBM Statistical Package for Social Sciences (SPSS) version 23.0 software. Quantitative variables were summarized using means and standard deviation while categorical variables were summarized using frequencies and percentages. The relationship between categorical variables were tested using the Chi-square test of statistical significance. The level of significance was set at $p \leq 0.05$.

Ethical Approval

The ethical approval for this study was obtained from the Health Research and ethical review board of the Federal Medical Centre, Owerri Imo State. All the eligible respondents were properly informed about the objectives of the study, they consented to the study and their participation was voluntary and anonymous.

RESULTS

A total of 120 medical students participated in the study giving a response rate of 100%. The mean age of the respondents was 27.7 ± 1.9 years and the majority of the respondents, 98 (81.7%) were in the age group 20–29 years. A higher proportion of the respondents, 66 (55.0%) were males while 54 (45%) were females. Majority of the respondents, 102 (85.0%) were married and majority 118 (98.3%) were also Christians. A higher proportion of the respondents 83 (69.2%) were Igbos. [Table 1] Overall, 99 (82.5%) of the respondents had good knowledge, 16 (13.3%) had moderate knowledge and 5 (4.2%) had poor

knowledge of COVID-19 infection. Majority of the respondents 119 (99.2%) knew that COVID-19 infection is real. Also, the majority 114 (95%) and 110 (91.7%) respectively knew that COVID-19 infection does not only affect the elderly or only those with chronic diseases. Majority of the medical students 105 (87.5%) knew that COVID-19 infection leads to death in young people. Similarly, majority 92 (76.7%) of the respondents were willing to recommend the COVID-19 vaccine to others. [Table 2]

Majority of the respondents were aware of the existence of COVID-19 vaccines, however, only 53 (44.2%) of the respondents had received at least a dose of the vaccine. A higher proportion of the respondents 98 (81.7%) had been screened for COVID-19 infection and 7.1% (n= tested positive). Half of the recipients 27 (50.9%) had received at least 2 doses of the vaccine while only 2 (3.8%) had received at least 2 doses and a booster dose. Some of the barriers to vaccination reported among 67 (55.8%) of the respondents include fear of side effects 37 (55.2%), indifference 17 (25.4%), unavailability of the vaccine 7 (10.4%), and religious reasons 2 (2.9%). Less than half of the respondent's relatives 53 (44.2%) had been vaccinated for COVID-19 infection. Also, 18 (15%) of the respondents' relatives had tested positive for COVID-19. A higher proportion of 92 (76.7%) of the respondents were willing to recommend COVID-19 vaccine to others while 28 (23.3%) were not willing to recommend the vaccine. [Table 3]

Further analysis showed that no socio-demographic variable was found to be significantly associated with the knowledge of COVID-19 infection among the respondents. However, those thirty years and above and females had a higher proportion of good knowledge. Concerning willingness to recommend COVID-19 vaccine, having a relative who had received COVID-19 vaccine was significantly associated with respondents' vaccination status and willingness to recommend the COVID-19 vaccine.

Table 1: Socio-demographic characteristics of the respondents (n=120)

Variables	Frequency (n)	Percent %
Age (Years)		
20-29	98	81.7
≥30	22	18.3
Mean (SD)	27.7±1.9	
Gender		
Female	54	45.0
Male	66	55.0
Marital Status		
Single	102	85.0
Married	18	15.0
Religion		
Christianity	118	98.3
Islam	2	1.7
Ethnicity		
Igbo	83	69.2
Other tribes*	37	30.8

Other tribes*= Yoruba, Efik, Ibibio

Table 2: Knowledge of COVID-19 infection and willingness to recommend COVID-19 vaccine among the respondents

Variables	Frequency (n)	Percent (%)
Knowledge items (only correct answers)		
COVID-19 is real (True)	119	99.2
COVID-19 affects only the elderly (False)	114	95.0
COVID-19 affects only persons with chronic disease (false)	110	91.7
COVID-19 does not lead to death in young people (false)	105	87.5
Overall Knowledge		
Poor	5	4.2
Moderate	16	13.3
Good	99	82.5
Willingness to recommend COVID -19 vaccine		
Yes	92	76.7
No	28	23.3

Table 3: COVID-19 Screening and Vaccination status of the respondents

Variables	Frequency (n)	Percent (%)
Aware of the COVID-19 vaccine		
No	2	1.7
Yes	118	98.3
Screened for COVID -19		
No	22	18.3
Yes	98	81.7
Result of Test n=98		
Negative	91	92.3
Positive	7	7.1
Received COVID-19vaccination (n=120)		
No	67	55.8
Yes	53	44.2
Type of vaccine n=53		
Pfizer	8	15.1
AstraZeneca	39	73.6
Moderna	6	11.3
No of doses		
1	24	45.3
2	27	50.9
3	2	3.8
Reasons for non -vaccination (n=67)		
Fear of side effects	37	55.2
Unavailability of vaccine	7	10.4
Religious reasons	2	2.9
Indifference	17	25.4
Does not affect the young	1	1.5
Others*	3	4.5
Relative screened (n=120)		
No	102	85.0
Yes	18	15.0
Relatives vaccinated (n=120)		
No	67	55.8
Yes	53	44.2

Others*= not sure of the efficacy, yet to undergo a clinical trial

Multiple responses

DISCUSSION

Medical students are among the frontline healthcare workers who are at high risk of acquiring COVID-19 during their clinical attachment.²⁰ This study thus provided an overview of the knowledge of COVID-19 and identified factors associated with knowledge, vaccination status, and willingness to recommend COVID-19 vaccine among medical students. Our study showed that the majority of the medical students had good knowledge about COVID-19 infection. This finding is similar to results from Enugu, Southeast Nigeria which reported 81.9% of good knowledge among the respondents.¹⁸ However, studies in Ecuador and Iran reported slightly higher levels of knowledge 88% and 86.96% respectively.^{16,21} These high levels of knowledge reported in these studies despite the different questions used to assess COVID-19 knowledge could be because as potential health professionals, the respondents might have gained sufficient knowledge of COVID-19 during their course works or clinical postings.

In our study, female medical students had a higher level of good knowledge of COVID-19 infection. A similar study also reported a similar relationship between being a female and having a higher level of COVID-19 knowledge.²¹ Our study noted that few of the respondents tested positive for the virus similar to findings in Uganda and Romania where 4.8%¹³ and 11.6% of the respondents were diagnosed with SARS-CoV-2 infection.²² Though, despite the few cases reported in our study, medical students are considered a primary transmission source to their patients and relatives.²³ Surprisingly, only less than half of the respondents had been vaccinated against the COVID-19 virus despite being at greater risk of contracting the disease as health professionals. Some of the reasons for COVID-19 vaccine refusal reported by the respondents include fear of side effects, indifference, and unavailability of the vaccine. Several studies conducted among medical students in different parts of the world also reported similar findings: side effects of the vaccine, vaccine's safety, efficacy, and effectiveness as reasons for vaccine refusal/hesitancy.^{12,14,24,25}

This could be a result of insufficient information concerning the side effects of the vaccine or the vaccine itself²⁶ and reliance on social media that provided them with negative information.¹³ This should be a cause for concern for the policymakers and relevant authorities to ensure appropriate/relevant information is being circulated to sensitize the general public, especially on the vaccine side effects, safety, efficacy, and effectiveness. It is also imperative that the medical student's curriculum be comprehensive to cover emerging and re-emerging infectious diseases including COVID-19 infection.

It is interesting to note that majority of the respondents were willing to recommend the COVID-19 vaccine to others. Though this might be because most of the respondents knew that COVID-19 is real. However, they need to be more educated in order to disseminate accurate information to the public. Our study found that having relatives who had been vaccinated was significantly associated with respondents' vaccination status and their willingness to recommend COVID-19 vaccine to others. This is interesting to know as it shows that the relatives might act as agents of change to curb the spread of the virus by convincing other family members to get vaccinated against COVID-19.

CONCLUSION

This study has shown that respondents had a relatively high knowledge of COVID-19 virus infection. Though few had received the vaccine with the main concern being the side effects, majority were willing to recommend the vaccine to others. Therefore, efforts should be made by the Federal Ministry of Health and the Nigeria Centre for Disease Control to ensure that evidence-based information regarding the COVID-19 infection, especially regarding vaccine safety, is available to the public. This will further broaden their knowledge about the disease and also encourage them to accept the vaccine. We also recommend the development of a comprehensive curriculum for medical students on: vaccine safety and effectiveness, emerging and re-emerging infectious diseases.

Limitations

Since this study was done among medical students from a single medical school in Nigeria, the results

cannot be generalized to all medical students in Nigeria. Therefore, there will be a need for a more comprehensive (multi-center) study. Also, a causal relationship cannot be established as this was a cross-sectional study.

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Conflicts of Interest

Nil

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