

COVID-19 Vaccine: Vaccine Acceptance, Risk Perception, and Attitude Towards Vaccination among College Students and Staff in the Southeastern Universities, Nigeria

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Research Article

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Abstract

University students occupy a strategic position in the spread of coronavirus disease 19 (COVID-19) as they regularly travel around different locations with differing prevalence of the disease. This study was carried out to evaluate the acceptance of COVID-19 vaccines among university staffs and students in Southeastern universities of Nigeria. Self-administered anonymous online survey was conducted between 28th February and 30th June 2021, using various online social media handles. A total of 769 students and staff members participated in the study. Descriptive statistics for socio-demographics and other parameters were performed. The relationships between tested parameters were ascertained using bivariate Pearson's correlation. Multiple linear regression analyses were done to determine associations. All statistical analyses were performed using IBM SPSS statistics 23 and P value < 0.05 was considered statistically significant at 95% CI. The respondents were 48.1% female and 51.9% male with a mean age of 24.4 years. The acceptance rate of COVID-19 vaccine was 25.6% and 82.2% of participants expressed concern about the side effects of the vaccine. While the age, gender and states of respondents were positively associated, their faculties were negatively associated with risk perception of COVID-19 vaccine. Also, the various faculties, university affiliations ($P = 0.029$), and age ($P = 0.023$) of the respondents were negatively associated, while the State of the respondents ($P = 0.01$) was positively associated with attitudes towards general COVID-19 vaccination. There is need for more robust information and better dissemination of such among the public to boost their confidence in COVID-19 vaccination.

Introduction

The disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was first reported in Wuhan city of China in December 2019 [1, 2] and thus far has had a negative impact on human life and on economies around the globe. The viral disease outbreak was declared a global pandemic by World Health Organization (WHO) on 12th of March 2020 [1], and has since then spread across the world with millions infected and hundreds of thousands dead. The Weekly Operational Update on coronavirus disease 19 (COVID-19) by WHO reported that as at 20 June 2021 the world COVID-19 confirmed cases were 177,866,160 and the number of confirmed deaths was 3,857,974 [3]. Worst still, COVID-19 cases in Africa have been on the increase by over 20% week-on-week as the continent's third wave gains pace and nears the first wave peak of more than 120 thousand weekly cases recorded in July 2020 with the Democratic Republic of Congo, Namibia and Uganda having the highest number of weekly reported cases [3]. Similarly, in Nigeria, the Nigerian Centre for Disease Control (NCDC) Daily Update, has reported that as at 22 June 2021, the number of confirmed COVID-19 cases were 167,292, and number of deaths were 2,118 [4]. Nevertheless, from the outset when COVID-19 became a pandemic, researchers around the globe have been working collaboratively with the goal of developing vaccines against the disease. Several vaccine candidates have been developed and tested, and are being used today [2].

The COVID-19 vaccine has drawn great global attention [5]. From the time of the vaccine development, it had been expected that the vaccine will be made available free of charge to the poor with financing from the governments of each country, while the rich could voluntarily seek vaccines in private clinics [6].

However, a couple of concerns and questions were raised concerning the COVID-19 vaccine which translated to how much society and individuals value this vaccine and are willing to take it. The success of COVID-19 vaccination program will largely depend on people's acceptance of the vaccine if made available [5, 7–8].

Recently, global vaccine acceptance and public confidence in vaccines have fallen, even among the most vulnerable populations [8], as evidenced in many recent vaccination programs such as measles and seasonal influenza. This has thus far negatively affected the efforts put in place to curtail the spread of these diseases. Worryingly, Nigeria as a country has once had a serious case of mass vaccine refusal, an event which took place in the year 2003–2004, where northern Nigeria boycotted the polio vaccination program, which led to a resurgence of the disease in the country and beyond [1, 9–11], even though Nigeria was fortunate enough to be able to officially eradicate wild polio through a stringent measure in collaboration with WHO [1]. Putting into consideration the adverse effects, cost to curtail the spread of COVID-19 and recently, the cost of production and procurement of COVID-19 vaccines, the aim of this research was to provide more information on the social assessment and acceptance of these COVID-19 vaccines. This assessment becomes very important as it would yield useful information for the implementation of public policies in Nigeria, as bodies and agencies such as National Centre for Disease Control (NCDC) are working hard to curtail the COVID-19 pandemic and improve health services in the country.

More still, apart from growing attention on vaccinating groups which are more at risk of COVID-19, such as health care workers (HCW), attention has also been drawn to vaccination of young adults as one of the key populations in COVID-19 spread. From the last quarter of 2020 to early 2021, much information on COVID-19 vaccine acceptance in developed nations such as USA, China and UK have emerged. However, little is known about COVID-19 vaccine acceptance in Sub-Saharan Africa [12]. Therefore, the objective of this survey study was to investigate the acceptance, risk perception, and attitude towards COVID-19 vaccination among college students and staff in the Southeastern Universities of Nigeria. To the best of our knowledge, this is the first study carried out to determine COVID-19 vaccine acceptance/hesitance among the study group in Nigeria.

Materials And Methods

Study Design and Data Collection

Self-administered anonymous online survey was conducted among college students and staff in Southeastern Universities in Nigeria between 28th February and 30th June 2021, using various online social media handles -WhatsApp, Facebook and Telegram (via both personal accounts and group chats accounts) - with hash tag COVID-19 Vaccine: Vaccine Acceptance, Risk Perception, and Attitude towards general COVID-19 Vaccination among College students and staff in the Southeastern Universities, Nigeria. Responding to the questionnaire took 7 to 10 minutes to complete. However, due to poor resource nature among participants, especially, among students, such as lack of mobile android devices and data

for internet connections, we complemented the survey with manual administration of the questionnaire with strict adherence to COVID-19 safety protocols. The invitation for this survey for both online and manual approaches contained consent providing information regarding study purposes, procedures, voluntary nature, and confidentiality. Inclusion criteria included (1) being between 15 and 65 years of age, (2) being currently a full-time student enrolled in a University in Southeastern Nigeria and/or a full-time staff (academic or nonacademic) in any of the Southeastern Universities in Nigeria and, (3) willingness, consented and supplied the information contained in the questionnaire.

Measured Parameters

Socio-demographics

The respondents were asked to supply information on their age, gender, ethnicity, level of study, faculty, university/institution, state and whether a student or staff. For data analysis, some sociodemographic factors were coded as: gender (1 = male and 2 = female); ethnicity (1 = Igbo, 2 = Hausa, 3 = Yoruba and 4 = others); level of studies (1 = 100L, 2 = 200L, 3 = 300L, 4 = 400L, 5 = 500L, 6 = 600L and 7 = postgraduate); faculty (eleven major faculties were selected and coded 1 to 11 and others were given the code 12), states (1 = Abia, 2 = Anambra, 3 = Ebonyi, 4 = Enugu and 5 = Imo), Universities (1 = Anambra State University, 2 = Alex Ekwueme Federal University Ndufu Alike Ikwo, 3 = Caritas University Enugu, 4 = Ebonyi State University Abakaliki, 5 = Enugu State University of Technology, 6 = Federal University of Technology Owerri, 7 = Imo State University, 8 = Michael Okpara University Umudike, Umuahia, 9 = Nnamdi Azikiwe University Anambra State, 10 = University of Nigeria, 11 = Others) and staff (1 = academic and 2 = nonacademic).

COVID-19 Vaccine Acceptance

To assess participants' willingness to take COVID-19 vaccine (s), instruments for measuring vaccine acceptance as reported by Sarathchandra *et al.* [13] were adopted with some modifications. Briefly, the respondents were asked the following questions: Will you take COVID-19 vaccine if made available? Is COVID-19 vaccine safe and good to take? Is the timing for current COVID-19 vaccine appropriate? and, Should COVID-19 vaccine be made mandatory? Respondent were given the options (Yes, No and Not sure) for each question.

Risk Perception of COVID-19 Vaccines

Participants' risk perception of COVID-19 vaccines was assessed by asking them the following questions and response options: Are you concerned about the side effects of COVID-19 vaccine? (Yes, No or Not interested); Do you think there is adequate safety information about COVID-19 vaccine? (Yes, No or Not sure); What do you think is the most reliable source of information on COVID-19 vaccine? [Nigeria Center for Disease Control (NCDC), World Health Organization (WHO), Pharmaceutical industries, Religious bodies, Social media, Family and friends or Others]; Have you taken any vaccine for the past one year? (Yes, No or Not Sure); Do you know anyone who had a negative reaction to any vaccine? (Yes or No) and Do you think COVID-19 vaccine contain a dangerous substance? (Yes, No or Not Sure).

Attitude towards General COVID-19 Vaccination

To assess the participant's general attitudes towards COVID-19 vaccination, the following questions and response options were provided: Will you get COVID-19 vaccine if it is recommended by the government? (Yes, No or Not sure); If yes, where would you like to take COVID-19 vaccine? (Primary Health Centre, General Hospital, neither both or none of the centres); Would you advise any member of your family to take COVID-19 vaccine? (Yes, No or Not sure); and Does COVID-19 vaccine conflict with your belief? (Yes, No or Not sure).

Ethical Clearance:

The participants' samples were not required for the survey and thus ethical clearance was not necessary.

Data Analysis:

First, the data entered were vetted for possible data entry error(s) and for proper coding, then boxplots and stem-and-leaf plots were generated to identify outliers and normality (skewness and Kurtosis) and to examine the data distribution. Descriptive statistics for Socio-demographics, COVID-19 Vaccine Acceptance, Risk Perception and General Attitudes towards COVID-19 Vaccination were performed. The relationships between tested parameters were ascertained using bivariate Pearson's correlation. Multiple linear regression analyses were performed to determine the association of COVID-19 vaccine acceptance parameters, risk perception of COVID-19 vaccine and attitudes towards general COVID-19 vaccination parameters with sociodemographic of the participants. All statistical analyses were performed using IBM SPSS statistics 23. P value less than 0.05 was considered statistically significant at 95% CI.

Results

Descriptive Statistics

A total of 769 respondents took part in the survey with mean age of 24.37 ± 7.09 years, and participants minimum and maximum ages of 16 and 65 years, respectively. The highest proportion of respondents were of the age group of 15 – 25 years (554; 72.0%) followed by those of the age group of 26 – 36 years (165; 21.5%) while the least number of respondents were of the age group of 59-69 years (6; 0.8%). Most of the respondents were Igbos (647; 84.1%), and there were more males 399 (51.9%) than females (48.1%) that participated in the survey. Furthermore, there were 717 (93.2%) students and 48 (6.2%) staff that took part in the survey, and the highest number of students that participated in this study were in 300 level, while 600 level students had the least number of participant. The highest number of the respondents were from the Faculty of Medicine (Table 1).

In determining the COVID-19 vaccine acceptance (Table 2), when participants were asked if they will take COVID-19 vaccine if made available, 197 (25.6%) responded 'Yes', 323 (42.0%) responded 'No', while 249 (32.4%) responded 'Not sure'. More so, among other COVID-19 vaccine determining parameters, 169 (22.0%) of the participants responded that 'the vaccine is good and safe', while 224 (29.1%) responded

that 'the timing for current COVID-19 vaccine is appropriate' and only 107 (13.9%) responded that 'the vaccine should be made mandatory.'

Assessing the risk perception of COVID-19 vaccines, 632 (82.2%) respondents indicated that 'they are concerned about the side effect of COVID-19 vaccines'. However, 158 (20.5%) responded that 'there is adequate safety information about the vaccine', while 357 (46.4%) and 253 (32.9%) responded 'No' and 'Not sure whether there is an adequate safety information about COVID-19 vaccines', respectively.

In the general attitudes towards COVID-19 vaccines, 212 (27.6%) responded 'Yes that they will take COVID-19 vaccines if recommended by the government', while 590 (76.7%) respondents responded that 'the vaccines do not conflict with their belief' (Table 2).

Correlation Analyses

The ages of the respondents were positively correlated to various ethnic groups ($r = 0.095$; $p = 0.008$) and various faculties of the respondents ($r = 0.081$; $p = 0.026$). The various ethnic groups were positively correlated with various faculties ($r = 0.167$; $p = 0.000$), but negatively correlated with genders of the respondents ($r = -0.119$; $p = 0.001$). Furthermore, there were negative correlations between the various faculties of respondents to COVID-19 vaccine acceptance and attitudes towards general COVID-19 vaccination. In addition, attitudes towards general COVID-19 vaccination was positively correlated to COVID-19 acceptance and risk perceptions towards COVID-19 vaccine. Details of these and other correlations among the survey parameters are presented in Table 3.

Multiple Regression

The multiple regression analyses to determine the association of the COVID-19 vaccine acceptance, risk perception of COVID-19 vaccine and attitude towards general COVID-19 vaccination with socio-demographics of the respondents showed that various faculties of the respondents were negatively associated with the COVID-19 vaccine acceptance parameter "Is COVID-19 vaccine safe and good to take?" ($B = -0.018$; $P = 0.028$) (Table 4) with 19% variance on COVID-19 vaccine acceptance. Furthermore, there was 6% variance risk perception of COVID-19 vaccine where the gender of the respondents was positively associated with risk perception COVID-19 vaccine determinant "Do you think there is adequate safety information about COVID-19 vaccine?" ($B = 0.198$; $P = 0.000$). Contrastingly, university affiliation of respondents was negatively associated with risk perception determinant "Do you think there is adequate safety information about COVID-19 vaccine?" ($B = -0.034$; $P = 0.000$). Age of respondents, gender and states of respondents were positively associated with risk perception of COVID-19 vaccine, while various faculties of the respondents were negatively associated with risk perception of COVID-19 vaccine (Table 5). In addition, the various faculties, university affiliations ($B = -0.020$; $P = 0.029$), and age ($B = -0.011$; $P = 0.023$; 3.6%) of the respondents were negatively associated with attitudes towards general COVID-19

vaccination, while the state of the respondents ($B = 0.041$; $P = 0.014$; 3.6%) was positively associated with attitudes towards general COVID-19 vaccination (Table 6).

Discussion

Determining COVID-19 vaccine acceptance, risk perception and general attitudes toward COVID-19 vaccination are keys to defining prevention strategies, and allowing visualization of the perceived benefits of the investment that research laboratories had in developing COVID-19 vaccines, which is important considering the current global resurgence of various SARS-CoV-2 variants. This study, to the best of our knowledge, is the first study carried out to determine the COVID-19 vaccine acceptance, risk perception and general attitudes toward COVID-19 vaccination among college students and staff in the Southeastern Universities in Nigeria. Thus, in this study, 769 respondents took part in the survey with mean age of 24.37 ± 7.086 years, and participants' minimum and maximum ages of 16 and 65 years, respectively. The highest respondents were in the age group of 15–25 years (554; 72.0%) followed by those within the age group of 26–36 years (165; 21.5%), while the least number of respondents were within the age group 59–69 years (6; 0.8%). Most of the respondents were Igbos (647; 84.1%), and there were more male 399 (51.9%) than female (47.7%) participants in the survey study, in contrast with the study by Jain *et al.* [14], which had more female respondents.

The number of respondents in this study is lower than 3089 gotten in France [15], 3805 in Lebanon [16], and 1062 in South Carolina USA [5], but higher than 330 gotten in China [17], 440 in the Northwestern Nigeria [18], 423 in Ethiopia [19], 282 in a Southern USA University [20], and 655 in India [14]. The disparity in the numbers of respondents may depend partly on ease of respondents' access to questionnaires, location, culture, and/or the readiness of respondents to respond to the questionnaire. The mean age in this study is lower than 35 years mean age [12], 36.3 years mean age [21] and 42.5 years mean age [22] gotten from other studies. However, the mean age difference in these studies is probably due to the target population studied, where the mean age in this study is corroborated with studies by Qiao *et al.* [5] among college students in South Carolina, USA, where they found the mean age of the respondents to be 23.83 years, and 20.3 years gotten in France [15], showing that colleges students are mostly teens and young adults.

The 25.6% of the respondents who agreed to take the vaccine if made available in this study is quite small compared to 58.0% gotten from a study in France [15], 36.4% in China [16], 87% in Lebanon [16], 40.0% in the Northwestern Nigeria [17], 57.5% in USA [22], 73.9% in Greece [23], 74.47% in Nigeria [10] and 75.8% in Italy [24] carried out in various target populations. However, similar to what was obtained in this study, Nzaji *et al.* [1] found out that only 27.7% of HCW agreed that they would accept a COVID-19 vaccine if it was made available in the Republic of Congo, thus supporting or suggesting the findings that African countries have lower rate of vaccine acceptance, albeit COVID-19 vaccines. The good number of respondents who said they are not sure if they will accept COVID-19 vaccines in this study, are likely to be convinced to accept the vaccines if some of the factors such as well definition of the vaccine safety is met. Young adults generally tend to feel they are healthier than the older people, and probably feel they

have lower risk of contracting COVID-19 as was shown in the study by Jain *et al.* [14], where only one-third (33.4%) of the student respondents in India were concerned about contracting the COVID-19 virus.

To further determine the vaccine acceptance among the university students and staff in this survey, the respondents were asked “Is COVID-19 vaccine safe and good to take?”, while 22% said Yes, 54.5% said Not sure, and 23.4% said No. The low vaccine acceptance in this study also depends on the belief by respondents that the timing for current COVID-19 vaccine is inappropriate as 224 (29.1%) said Yes, 290 respondents (37.7%) said No and 253 (32.9%) said they are not sure. Moreover, 75.7% said No that the vaccine should not be made compulsory, suggesting that the respondents do not want them to be compelled to take COVID-19 vaccine. The low percentage of vaccine acceptance in this study may also depend on the perceived risk. Thus, when the respondents were asked “Are you concerned about the side effects of COVID-19 vaccine?” 632 (82.2%) said Yes, while 67 (8.7%) and 70 (9.1%) said No and Not Sure, respectively. Similarly, Tobin *et al.* [25] stated that 436 (71.4%) of the respondents in their study stated that one of the reasons for their COVID-19 vaccine refusal is that they were concerned about the side effects.

Furthermore, when the respondents were asked “Do you think COVID-19 vaccine contain a dangerous substance?” 200 (26.0%) said Yes, 173 (22.5%) said No, while 394 (51.2%) said they were not sure. These responses show, however, that there may be high perceived risk of COVID-19 vaccine among the respondents. When compared with the findings in this study, Tobin *et al.* [11] revealed that in the general population of Nigeria, perception of risk was very high among 218 (17.8%) respondents, high for 288 (23.5%), low for 340 (27.7%) and no risk for 382 (31.1%) respondents. They however stated that HCW had a significantly higher perception of risk; 56.4% (88/156) of them compared to 39.0% (418/1072) of non-HCW. The big difference between the respondents that are concerned about the side effects (82.2%) and those that think COVID-19 vaccine contain a dangerous substance (26.0%), shows that the respondents are not afraid of being specifically targeted as was the case with poliomyelitis vaccine rejection in some Northern Nigeria states in 2003 [9], but of a general concern of vaccine side effects, which is common in some populations. Furthermore, the low vaccine acceptance and high risk perception in this may not be unconnected to the findings by Adebisi *et al.* [10] in their study to assess public perception of hypothetical COVID-19 vaccine in Nigeria. They revealed that among the 132 respondents that would not take the COVID-19 vaccine, the major reason for non-acceptance of COVID-19 vaccine was unreliability of the clinical trials [49 (37.12%)], followed by the belief that their immune system was sufficient to combat the virus [36 (27.27%)].

The trust of the citizens in national institutions will have a direct relationship with their level of acceptance of information originating from them, which will in turn affect their compliance or otherwise with government directives. Thus, when the respondents in this study were asked what they thought is the most reliable source of information on COVID-19 vaccine, majority of them, 442 (57.5%) said WHO, while as few as 148 (19.2%) said it is Nigeria Center for Disease Control (NCDC) (Table 2). Thus, the high reliance on WHO for information about COVID-19 vaccines may be attributed to the quality and reliability of the information published on weekly, monthly and quarterly bases by NCDC on current issues about

COVID-19 vaccines, especially the safety profile and clinical trials and approval. Contrastingly, the study by Jain *et al.* [14] among India students revealed that about a little less than two-thirds (64.5%) of the students responded that they have trust in the healthcare system of India, and a little more than half (56.0%) responded that they have confidence in domestic vaccines.

The attitude towards COVID-19 general vaccination in this study showed that greater percentage (49.2%) of the studied population stated that they were unwilling to take COVID-19 vaccine if recommended by the government, and also 349 (45.4%) of the respondent said that they will not advice any of their family members to take the vaccines. However, greater percentage of the studied population 590 (76.7%) said that COVID-19 vaccine do not conflict with their belief. Contrastingly to the existing health behavioral theories, although not accessed in this study, which posit that higher perceived susceptibility predicts stronger motivations of taking protective actions, such as vaccine uptake and inconsistent with extant literature on COVID-19 vaccine acceptance. Qiao *et al.* [5], found that perceived susceptibility was not significantly associated with COVID-19 vaccine acceptance among college students which may be attributed to the optimistic bias in college students who are not viewing the virus as a serious threat. The low willingness to take COVID-19 vaccine may also be an optimistic bias hinged partly on mistrust in the Nigeria government about the vaccine and also on their unconcern about the entire vaccination program.

We have shown in this study that the attitudes towards general COVID-19 vaccination is positively correlated to COVID-19 acceptance and risk perceptions towards COVID-19 vaccine. This is similar to the results of the study by Qiao *et al.* [5], in which COVID-19 vaccine acceptance was positively related with perceived severity of COVID-19 and fear of COVID-19. In this regards, the low acceptance of COVID-19 vaccine among the respondents in this study may not be unconnected with the well known facts that COVID-19 severity has been generally milder in many African countries including Nigeria when compared to most other parts of the world [26–28]. Furthermore, a similar study in another population group by Williams *et al.* [8] revealed that the willingness to receive a COVID-19 vaccination was positively associated with the belief that the COVID-19 outbreak is going to continue for a long time, and negatively associated with the belief that the media has over-exaggerated the risks of getting infected with COVID-19 viruses. Contrastingly to the findings in this study, there were no significant correlations between intention to vaccinate and the other questions tapping perceptions of COVID-19, or with age. Williams *et al.* [8] further stated that higher levels of worry about COVID-19 were positively associated with perceived likelihood of infection, severity, and age. Similar to the findings in this survey, Nzaji *et al.* [1] found out that some measured variables on COVID-19 vaccine acceptance among HCW in the Democratic Republic of Congo were significantly associated with COVID-19 vaccine acceptance after stepwise selection including: older age, occupation, belief that isolation and treatment of people who are infected with COVID-19 are effective ways to reduce the spread of the virus.

The multivariable analysis in this study shows that the various faculties of the respondents were negatively associated with the COVID-19 vaccine acceptance, and the gender of the respondents was positively associated with risk perception of COVID-19 vaccine. Contrastingly, Jain *et al.* [14] revealed that those who trusted the healthcare system (vs. those who did not trust) and those who had confidence in

domestic vaccines (vs. those who did not have confidence) had higher odds of reporting willingness to receive COVID-19 vaccines. Furthermore, the university affiliation of respondents in this study was negatively associated with risk perception, while age, gender and states of respondents were positively associated with risk perception of COVID-19 vaccine, and various faculties of the respondents is negatively associated with risk perception of COVID-19 vaccine. Tobin *et al.* [25] reported that among different population groups in Nigeria, respondents who were greater than 25 years were 1.66 times likely to accept a COVID-19 vaccine with acceptability increasing with advancing age. Muslims were 1.57 times likely to accept a vaccine compared with Christians. Also that the females were 0.77 times likely to accept the vaccine compared to males, and self-employed respondents were 0.68 times likely to accept a vaccine compared with those in government service ($P = 0.02$, 95% CI 0.52–1.03). Additionally, we found that the various faculties ($B = -0.024$; $P = 0.001$; 2.2% and $B = -0.010$; $P = 0.045$; 3.6%), university affiliations ($B = -0.020$; $P = 0.029$) and age ($B = -0.011$; $P = 0.023$; 3.6%) of the respondents were negatively associated with attitudes towards general COVID-19 vaccination, while the states of the respondents ($B = 0.041$; $P = 0.014$; 3.6%) was positively associated with attitudes towards general COVID-19 vaccination. Inasmuch as students are seen as trusted influencers and ambassadors of vaccine promotion [14], understanding their willingness to take COVID-19 vaccine would be helpful to advancing the effort in increasing the vaccine acceptance among the general population. Although, this study showed a low COVID-19 vaccine rate, strengthening the Nigeria government's efforts on information dissemination about the COVID-19 vaccines and their safety profile will be helpful and thus may increase COVID-19 vaccine acceptance, especially among college students.

There were some limitations in this study, for example the respondents were predominantly students which limits the generalization of the involvements of both staff members and students. Moreover, there may be bias on the anonymity of the administration of the questionnaire. However, the study has advantage of using both online and manual approach that allowed for easier access to the survey questionnaire, thus covering a wider status of the study population.

Conclusions

This study was conducted to evaluate the acceptance of COVID-19 vaccines among university students and staff in Southeastern Nigerian universities. The findings revealed that the acceptance of COVID-19 vaccines in the study population was very low and that one of the major reasons accounting for that was concern of vaccines' safety. It was found that the lack of trust on the government agency that is charged with managing and controlling the pandemic in the country was also a contributing factor. The authorities concerned should articulate and disseminate more robust information to boost the confidence of the population in COVID-19 vaccination. More studies that will cover other important populations in the country and wider geographical areas are recommended.

Declarations

Compliance with Ethical Standard: This study received no funding.

Conflict of Interest: The authors declare that they have no conflict of interest.

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Tables

Tables 1-6 are in the supplementary files section.

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