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Attitude Towards Covid-19 Vaccines and Willingness to be Vaccinated Among Orientation Camp Dwellers in Ikare-Akoko, Ondo State, Nigeria

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ABSTRACT

We assessed the awareness of COVID-19, COVID-19 vaccine, and willingness to be vaccinated among Nigerian camp dwellers. The study was a descriptive cross-sectional study. All National Youth Service Corps (NYSC) members and Officials in NYSC permanent orientation camp, Ikare Akoko, Ondo state who gave consent were enrolled in the study. A total of 848 participants were enrolled out of 1000 target population. Data were collected using an interviewer administered questionnaire. All data were analyzed using R 4.1.0. Chi-square tests was performed on statistically significant variables at p -values <0.05 . The average age of the respondents was 26.05 years (SD=4.8). Further analysis showed that 88% (n=677) were aged between 20 to 29 years with 50.1% (n=425) being male respondents. Sources of information about COVID-19 vaccine varied, but the top three mentioned sources were radio/television (53.5%, n=454), social media (32%, n=271), and health workers (13.4%, n=114). Majority of the respondents (81.9%, n=675) were willing to accept COVID-19 vaccination, with slightly more than half (67.6%, n=554) responding affirmatively to pay not more than ₦200 (0.49 USD) for the vaccine. Interestingly, only 5.8% were willing to pay more than ₦2000 (more than 5 USD) to be vaccinated. A greater proportion of the respondents are willing to accept and pay for COVID-19 vaccine. However, it is recommended that more advocacy on the importance of COVID-19 vaccine should be carried out periodically. Also, COVID-19 vaccines should be readily available at little or no cost to ensure widespread uptake.

Keywords: COVID-19; COVID-19 Vaccine; COVID-19 Vaccine Attitude; COVID-19 Vaccine Acceptance; Camp Dwellers.

INTRODUCTION

Coronavirus disease (COVID-19) is caused by the novel beta coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The disease was first reported in December 2019 in Wuhan, China [1], and the full genome was sequenced and published by January 05, 2020[2]. The disease primarily affects the respiratory tract and its pathophysiology can range from very mild rhinorrhea to severe acute respiratory distress syndrome and death [3]. Non-respiratory symptoms such as anosmia, diarrhea, rash, thromboembolic disorders, myocarditis, and vasculitis have also been associated with COVID-19 [4]. Given that the COVID-19 pandemic has made a devastating impact economically and on the healthcare sector globally, the need to create lasting measures to curtail the disease has been of great concern [5].

Presently, there are limited specific drugs approved for the treatment of COVID-19 and this has led to intense research on the development of vaccines to provide immunity against the virus as they prove to be a more effective means of reducing the risk of COVID-19 disease [6]. While vaccines have proven to be one of the most effective public health tools in the prevention and control of infectious diseases, only one human disease, smallpox, has so far been eradicated by vaccination [7]. Therefore, with the rapid spread and infection rate of the virus, the need to develop vaccines for COVID-19 became pertinent. This has increased efforts globally and led to huge scientific progress in the rapid development of COVID-19 vaccines. Before the fastest produced COVID-19 vaccine, was the traditional process of vaccine development that normally takes several years to accomplish. Mumps vaccine took four years to be developed in the 1960s [8]. However, by December 2020 (in just a year after the first reported case), over 200 COVID-19 vaccines were developed with about 52 in clinical trial stages.[9].In Nigeria, the first batch of COVID-19 vaccines was received in March 2021 followed by another batch received from the COVAX Facility on the 1st of August 2021. Also, the United States government donated over 4 million doses of the Moderna COVID-19 vaccine with the latest delivery of 177,600 doses from Johnson and Johnson on the 12th of August 2021 which marked the first delivery of vaccines received through the African Union [10].

Availability and supply of the COVID-19 vaccine is the first step to ensuring an increase in levels of vaccination and aid reduction in risk of infection. However, population demand and willingness to accept the vaccine still have a role to

play in determining the successful delivery of the vaccine to the populace. Unwillingness to accept vaccines, as well as erroneous perception by people, is a major challenge in the successful delivery of vaccines. Vaccine acceptance is influenced by three factors: confidence, convenience, and complacency. Confidence involves trust in the safety and efficacy of the vaccine, the healthcare system administering the vaccine as well as trust in the intentions of the policymakers that decide on the implementation of the vaccine. Complacency occurs when the risks of diseases preventable by vaccines are perceived to be low and hence vaccination is not considered necessary thus leading to negative attitudes towards the vaccine [11] and Convenience refers to accessibility, affordability, and physical availability of the vaccine [12]. Acceptance of vaccines is also influenced by misinformation as seen in previous vaccination programs such as the polio vaccination campaign programme held in Kano, Nigeria (2003) which experienced a major setback due to misinformation about the safety of the vaccine. The same issue has been observed in this era of COVID-19 in which several people appeared not to believe in the existence of the disease and are unwilling to take necessary preventive measures [13]. Hence, the level of awareness determines the acceptance of vaccination and willingness to be vaccinated which needs to be considered in the introduction of health interventions such as vaccine delivery [14].

Furthermore, vaccine acceptance has been reported to be influenced by cost evaluation particularly in settings where health care costs are mainly out-of-pocket. However, direct costs for procurement of vaccines are most times borne by the government to accelerate acceptance of the vaccine, which are then administered freely to the general population [7,15]. Despite this, indirect costs such as transportation, delay in being attended to, and slow online registration process at the health facility could still pose a threat to willingness to be vaccinated [14].

As a result of emergence of COVID-19, its effect on the healthcare and economic sector, as well as ongoing efforts to control this infection through the development of safe and effective vaccines, it is important to assess the attitude and willingness of Nigerians to be vaccinated as they constitute a larger proportion of the Nigerian population. Hence, this study aimed to assess the awareness of COVID-19 vaccine, and willingness to be vaccinated among Nigerians. Findings from this study would aid prompt interventions such as advocacy and implementation of strategies to improve the level of acceptance of vaccines.

METHODOLOGY

Study Design and Study Setting

The study was a descriptive cross-sectional study among Nigerians. It was carried out among 2020 Batch B National Youth Service Corps (NYSC) members and camp officials at the NYSC Permanent Orientation Camp located in Ikare Akoko, Ondo State from 5th to 8th of December 2020. Ikare- Akoko popularly known as Ikare is a city in South-western Nigeria surrounded by Owo (South), Ado-Ekiti (North-West), Kabba (North), and Okene (North-East). It is about 100km from Akure, the Ondo state capital, and is in the Northern Senatorial District of Ondo State. Ondo state ranks 9th in states affected by COVID-19 as at September 16, 2021 with 4,346 cases and 83 deaths reported by the Nigerian Center for Disease Control (NCDC).

Enrollment of Participants into the Study

All NYSC members and officials aged 18 years and above were eligible to participate in the study. Ethical approval was granted by the Nigerian Institute of Medical Research (NIMR) Institutional Review Board (IRB) with IRB number IRB/20/083. Informed consent was sought from NYSC members and officials verbally and written. All individuals who provided consent were also included in the study. Individuals less than 18 years of age and those who did not provide consent were excluded from the study. A total of 848 (84.8%) participants were enrolled out of 1000 target population sample size.

Data Collection

Questionnaires were administered physically to the Nigerian Youth Service Corps (NYSC) members and officials attending the NYSC Orientation Camp Exercise in Ikare-Akoko that gave their consent to participate in the study. The questionnaire (<http://getjournal.org/wp-content/uploads/2022/12/Table-S1-GJOB0H-2022-015.pdf>) comprised data on the Socio-Demographic characteristics of the participants, and Attitude towards COVID-19 which included Knowledge of COVID-19 and COVID-19 Vaccine, Willingness to accept COVID-19 Vaccine, and Willingness to pay for COVID-19 Vaccine.

Socio-Demographic Characteristics

The socio-demographic characteristics of the participants include information on age, gender, state of origin, and ethnic group.

Attitude Towards COVID-19

This included information on the following;

- a. Knowledge of COVID-19 and COVID-19 Vaccine:
- a. Willingness to Accept COVID-19 Vaccine
- b. Willingness to pay for the COVID-19 Vaccine:

Data Analysis

All data obtained from the participants in this study were extracted from the questionnaires of the 848 participants and analyzed using frequency tables, cross-tabulations, and chi-square. All data were analyzed using R 4.1.0. Chi-square tests were conducted on statistically significant variables at p -values <0.05 .

RESULTS

Demographic Characteristics

A total of 848 responses were collected (table 1). This represented 84.8% of the targeted sample while the remaining 15.2% were non-respondents. Majority of the respondents were from Delta State (9.1%, $n=77$), Edo state (8.5%, $n=72$) and Ondo State (8.2%, $n=69$). In addition to that, the average age of the respondents was 26.05 years ($SD=4.8$). Further analysis showed that 88% ($n=677$) were aged between 20 to 29 years. Moreover, there was an almost equal representation of gender among respondents, with 50.1% ($n=425$) being male respondents, 48.8% ($n=414$) being female respondents, and 1.1% ($n=9$) not indicating their gender. Majority (78%, $n=653$) were Christians, and the ethnic group distribution was Other ethnic groups (34.1%, $n=283$), Igbo (32.3%, $n=268$), Yoruba (20.6%, $n=171$) and Hausa/Fulani (12.9%, $n=107$) as shown on the table below:

The geographical distribution of respondents showed that 24.7% respondents were from the North, 25.7% from the East, 17.7% from the West and 26.8% from the South. A cross-tabulation of age groups and gender showed that the majority age group for both genders was between 20 to 29 as shown in figure 1 below. A chi-square test confirmed that there was no significant association between gender and age group ($\chi^2(10) = 6.1126$, $p = 0.806$).

Table 1: Socio-Demographic Characteristics

Question	Responses	Base	n	%
Total Interviews			848	
SECTION A: SOCIO-DEMOGRAPHIC BACKGROUND				
State of Origin	Delta	846	77	9.1%
	Edo	846	72	8.5%
	Ondo	846	69	8.2%
	Imo	846	66	7.8%
	Kogi	846	60	7.1%
	Enugu	846	55	6.5%
	Anambra	846	52	6.1%
	Not indicated	846	43	5.1%
	Abia	846	30	3.5%
	Akwa Ibom	846	22	2.6%
	Kaduna	846	21	2.5%
	Cross-river	846	20	2.4%
	Bayelsa	846	18	2.1%
	Benue	846	18	2.1%
	Rivers	846	18	2.1%
	Kano	846	17	2.0%
	Ogun	846	17	2.0%
	Ebonyi	846	15	1.8%
	Niger	846	15	1.8%
	Ekiti	846	14	1.7%
	Kwara	846	14	1.7%
	Osun	846	14	1.7%
	Plateau	846	12	1.4%
	Bauchi	846	10	1.2%
	Lagos	846	10	1.2%
	Oyo	846	10	1.2%
	Katsina	846	9	1.1%
	Taraba	846	9	1.1%
	Gombe	846	8	0.9%
	Nasarawa	846	7	0.8%
	Jigawa	846	5	0.6%
	Borno	846	4	0.5%
	Adamawa	846	3	0.4%
	Kebbi	846	3	0.4%
	Sokoto	846	3	0.4%
	Abuja	846	2	0.2%
	Zamfara	846	2	0.2%
	Yobe	846	1	0.1%
What is your age?	Average (sd) age	26.05 (4.8)		

Age group	Less than 9	0	0	0
	10 to 19	769	13	1.7%
	20 to 29	769	677	88.0%
	30 to 39	769	64	8.3%
	40 to 49	769	8	1.0%
	50 to 59	769	6	0.8%
	more than 60	769	1	0.1%
How will you describe your gender?	Male	848	425	50.1%
	Female	848	414	48.8%
What is your religion?	Not indicated	848	9	1.1%
	None	837	3	0.4%
	Christianity	837	653	78.0%
	Islam	837	177	21.1%
	Traditional	837	3	0.4%
	Atheist	837	1	0.1%
Which one of the following would you say is your ethnic group?	Hausa/Fulani	829	107	12.9%
	Igbo	829	268	32.3%
	Yoruba	829	171	20.6%
	Others	829	283	34.1%

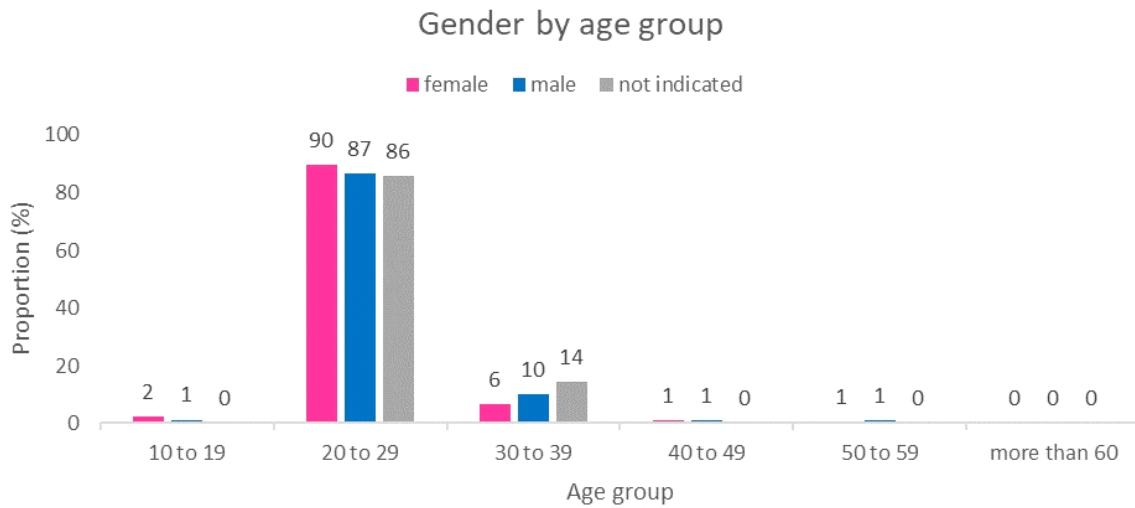


Figure 1: Gender by age group distribution

Knowledge of COVID-19 and COVID-19 Vaccine

When asked if they had heard about COVID-19, the majority (96.8%, n=817) answered that they had heard about it. Sources of information about COVID-19 varied, but the top three mentioned sources were radio/television (53.5%, n=454), social media (32%, n=271), and health workers (13.4%, n=114). Afterward, the respondents were

asked if they had heard of the COVID-19 vaccine. A majority (82.5%, n=691) answered in the affirmative. Similarly, when asked about their source of information on the COVID-19 vaccine, the top three mentioned sources were radio/television (39.4%, n=334), social media (28.3%, n=240), and health workers (9.2%, n=78) as shown on the Table 2.

Table 2: Knowledge of COVID-19 and COVID-19 Vaccine

Question	Responses	Base	n	%
Have you heard of COVID-19?	Yes	844	817	96.8%
	No	844	27	3.2%
If yes, what was your source of information?	Health worker	848	114	13.4%
	Radio/Television	848	454	53.5%
	Newspaper	848	36	4.2%
	Public Health campaign	848	59	7.0%
	A Friend	848	27	3.2%
	Social media	848	271	32.0%
Have you heard of the COVID-19 vaccine?	Yes	838	691	82.5%
	No	838	147	17.5%
If yes, what was your source of information?	Health worker	848	78	9.2%
	Radio/Television	848	334	39.4%
	Newspaper	848	26	3.1%
	Public Health campaign	848	44	5.2%
	A Friend	848	15	1.8%
	Social media	848	240	28.3%

Willingness to Accept COVID-19 Vaccination

To assess willingness to accept vaccination, we asked respondents if they would be vaccinated if a safe and effective COVID-19 vaccine was provided free by the Federal Government. To this, most (81.9%, n=675) said they would, while the remaining 18.1% (n=149) said they would not (table 3). We probed further to know the reason why they would/would not be vaccinated. For those who answered in the affirmative, the most frequent

reasons mentioned were “no specific reason” (32.3%, n=218), “it is a preventative measure” (31.6%, n=213), “to be immune from other diseases” (15%, n=101). For those who would not be willing to get vaccinated, the top 3 reasons given were “no specific reason” (54.4%, n=81), “I don’t trust or believe in it” (19.5%, n=29), “I see no need/I don’t have COVID-19” (14.8%, n=22). All these are shown in Table 3.

Table 3: Willingness to Accept COVID-19 Vaccination

Question	Responses	Base	n	%	Sample response
Will you agree to be vaccinated if a safe and effective COVID-19 Vaccine is provided free by the Federal Government?	Yes	824	675	81.9%	
	No	824	149	18.1%	
If yes, why will you agree to be vaccinated?	as a preventative measure	675	213	31.6%	"to prevent covid-19"
	it is necessary/important	675	8	1.2%	"health is wealth, it is necessary to take care of yourself"
	no reason	675	218	32.3%	"no reason"
	peer pressure	675	4	0.6%	"peer influence"
	to be immune	675	101	15.0%	"to be immune against covid-19"
	to help stop the spread	675	44	6.5%	"to curb the spread"
	to know status/be sure	675	12	1.8%	"to be certain of noncontamination"
	to protect myself/family	675	44	6.5%	"to protect myself and family"
	to save lives	675	4	0.6%	"to save my life and others"
	unclear reason	675	27	4.0%	
	If not, why will you not agree to be vaccinated	I don't trust/believe in it	149	29	19.5%
I see no need/don't have COVID-19		149	22	14.8%	"I don't want the vaccine because I don't have COVID-19"
afraid		149	2	1.3%	"what if it is dangerous"
belief		149	3	2.0%	"They might give you the virus"
it is my right		149	2	1.3%	"It is my right"
no reason		149	81	54.4%	
not comfortable		149	2	1.3%	"not comfortable with it"
unclear reason		149	8	5.4%	

Willingness to Pay for COVID-19 Vaccination

We asked respondents if they would agree to be vaccinated if they had to pay for the COVID-19 vaccine. Slightly more than half (67.6%, n=554) answered that they would while the rest did not (table 4). We then asked those who said yes how

much they would be willing to pay. The majority were willing to pay not more than 200 Naira (65.7%, n= 364), while only 5.8% (n=32) were willing to pay more than 2000 Naira.

Table 4: Willingness to Pay for COVID-19 Vaccination

QUESTION	RESPONSES	Base (Total population)	n	%
Will you agree to be vaccinated if you have to pay for the COVID-19 vaccine?	Yes	820	554	67.6%
	No	820	266	32.4%
If yes, how much are you willing to pay to get the COVID-19 Vaccine?	Less than ₦200	554	197	35.6%
	₦200	554	167	30.1%
	₦500	554	71	12.8%
	₦1000	554	53	9.6%
	₦2000	554	12	2.2%
	Greater than ₦2000	554	32	5.8%

Association between Socio-Demographic Categories, Willingness to Get Vaccinated, and Willingness to Pay COVID-19 Vaccination

Chi-squared tests for association were conducted between age group, gender, religion, ethnic group, willingness to accept COVID-19 vaccination, and willingness to pay COVID-19 vaccination (table 5).

The results showed that there was a significant association between ethnic group and willingness to pay for COVID-19 vaccination ($\chi^2 (3) = 15.2051$ p= 0.002), as well as willingness to accept COVID-19 vaccination and willingness to pay for COVID-19 vaccination ($\chi^2 (1) = 134.8317$ p< 0.001).

Table 5: Association Between Socio-Demographic Categories, Willingness to Get Vaccinated, and Willingness to Pay COVID-19 Vaccination

Socio-demographic categories	Willingness to pay for the vaccine			
	no	yes	Total	
Age group				
10 to 19	1	12	13	Chi- square(5)=6.0945 p=0.297
%	0.42	2.37	1.74	
20 to 29	208	447	655	
%	87.03	88.17	87.8	
30 to 39	24	39	63	
%	10.04	7.69	8.45	
40 to 49	3	5	8	
%	1.26	0.99	1.07	
50 to 59	3	3	6	
%	1.26	0.59	0.8	
more than 60	0	1	1	
%	0	0.2	0.13	
Total	239	507	746	
%	100	100	100	
Gender				
Female	138	264	402	Chi-square(2)=1.7707 p=0.413
%	51.88	47.65	49.02	
Male	125	286	411	
%	46.99	51.62	50.12	
Not specified	3	4	7	
%	1.13	0.72	0.85	
Total	266	554	820	
%	100	100	100	
Ethnic group				
Yoruba	42	128	170	Chi- square(3)=15.2051 p=0.002
%	16.09	23.57	21.14	
Other Ethnic groups	88	190	278	
%	33.72	34.99	34.58	
Hausa/Fulani	27	76	103	
%	10.34	14	12.81	
Igbo	104	149	253	
%	39.85	27.44	31.47	
Total	261	543	804	
%	100	100	100	
Religion				
Christian	220	410	630	Chi-square(5) =10.5401 p=0.061
%	82.71	74.01	76.83	
Unspecified	2	6	8	
%	0.75	1.08	0.98	

Islam	41	134	175	
%	15.41	24.19	21.34	
Traditional	2	1	3	
%	0.75	0.18	0.37	
None	1	2	3	
%	0.38	0.36	0.37	
Atheist	0	1	1	
%	0	0.18	0.12	
Total	266	554	820	
%	100	100	100	
Willingness to get vaccinated				
Yes	155	508	663	Chi-square(1)
%	59.62	93.04	82.26	=134.8317 p<0.001
No	105	38	143	
%	40.38	6.96	17.74	
Total	260	546	806	
%	100	100	100	

DISCUSSION

Over time, vaccines have played an important role in the prevention and control of many infectious diseases of public health concern [7]. Findings from a scoping review by Ilesanmi *et al.* [16] show that a person's demographics, health-related views, vaccination beliefs and attitudes, vaccine advocacy and social factors, are likely to play a major role in any targeted vaccination programme. This study explored the perception of Nigerians presenting for the mandatory one-year National Youth Service camping programme in South Western Nigeria on the willingness to be vaccinated. A large population of the respondents were from Southern Nigeria (26.8%) with Delta and Edo states having the highest representation followed by East (25.7%), North (24.7%) and West (17.7%). Also, there were more male than female respondents. However, the females were well represented also as the difference was less than 2%. Our findings revealed that the majority of the respondents were between 20-29 years. This was similar to a study by AlShurman *et al.* [17] which also showed higher respondents within the same age range.

As regards the knowledge of COVID-19, the majority of the respondents which were educated youths showed good knowledge about COVID-19. This supports a review carried out by Nwagbara *et al.* [18] which revealed that most participants had adequate COVID-19 related knowledge in sub-Saharan Africa. However, a

study carried out by Anorue *et al.* [19] in South-Eastern Nigeria supports our findings on good COVID-19 vaccine knowledge among study participants. Communication (radio/television) and social media were the main sources of information on the knowledge of COVID-19 vaccine in our study. This is similar to a study carried out in Ethiopia which revealed that media influenced COVID-19 vaccine awareness positively among the populace [20]. A possible explanation for this could be attributed to the unlimited dissemination of COVID-19 related information on various media, as well as advances in technology that allow the transmission of radio and television stations on smartphones.

The quick roll out time that characterized the COVID-19 vaccine has become a source of doubt and uncertainty on the safety, as well as effectiveness of the vaccines [21] coupled with myths and propaganda that has trailed the release of the vaccines, thereby reducing confidence and affecting willingness to accept the vaccine. In this study, however, the majority (81.9%) of the respondents stated that they would be willing to take the vaccine, citing its importance as a preventive measure, as the reason given by some of the respondents. Our findings were similar to studies by Solis *et al.* [22] (80.3%) in low- and middle-income countries though the percentage of respondents willing to accept vaccination was lower in the latter than in our study population. This is in contrast with a study that was conducted amongst health workers in a health facility in

southern Ethiopia [23], which had a lower percentage of its respondents willing to take the vaccine with concerns being its safety and effectiveness. This could be as a result of even bias among the educated Nigerians and exposure on the part of the health workers on vaccine effectiveness and safety compared to the general populace.

Furthermore, only slightly more than half of the study respondents indicated that they would agree to be vaccinated if they had to pay for the COVID-19 vaccine. This is in accordance with the study carried out by Krep and Kriner [24] which showed that the majority of Indonesian adults were willing to be vaccinated and expressed their willingness to pay for the COVID-19 vaccine. This could lead to problems in attaining herd immunity. Currently it is estimated that 60% of the individuals need to be immune to attain herd immunity [24]. With our study results, it is doubtful that herd immunity through vaccination could be obtained without financial subsidies to vaccination. Also, more than half (65.7%) of the study respondents who indicated interest in paying for COVID-19 vaccination were willing to pay not more than two hundred naira (0.49 USD at open exchange rate of 410 naira to a dollar) which correlate with study that revealed that just about half (49.3%) of respondents who were willing to pay for vaccines were not willing to spend more than five hundred naira (1.22 USD) for COVID-19 vaccination [24]. This implies that going by the estimated cost of COVID-19 vaccine ranging between 2 and 37 USD per dose [24] the Nigerian populace might not be able to afford to pay for COVID-19 vaccine if the Government puts a cost on COVID-19 vaccine despite the overwhelming willingness to be vaccinated.

There was no significant association between socio-demographic categories and willingness to pay for COVID-19 vaccination, however, due to a biased population, there was significant association between those who are willing to get vaccinated and willingness to also pay. Majority of those who were willing to get vaccinated were also willing to pay, this is in contrast with a study by Adigwe [25], which reported the majority of the participants not willing to pay for COVID-19 vaccine. The willingness to get vaccinated and even pay as reported in our study shows a level of trust in the efficacy of the vaccines as well as the willingness on the part of Nigerians to participate in curbing the spread of the virus. In this study, the respondents were largely literate. The Findings from this study therefore may not be generalizable in a less-literate setting. Also, the use of a small sample size limited the results obtained during further analysis, resulting in an

extremely large confidence interval. Hence, for future studies, a larger sample size will be important to make a more informed decision.

However, literacy and open-mindedness, if imbibed, would go a long way in ensuring COVID-19 is fought and won in the nearest future.

CONCLUSION

Based on the findings from this study, it is plausible to say a greater proportion of the respondents are willing to accept and pay for vaccination. In the same vein, COVID-19 vaccines should be readily available at little or no cost. In light of this, it can be recommended that more advocacy on the importance of COVID-19 vaccination should be carried out periodically. This will further increase the willingness and uptake of the COVID-19 vaccination among the Nigerian population.

REFERENCES

- [1] Zhu H, Wei L, Niu P. The Novel Coronavirus Outbreak in Wuhan, China. *Glob Health Res Policy* 2020; 5, 6 . [<https://doi.org/10.1186/S41256-020-00135-6>]
- [2] Wu F, Zhao S, Yu B. A New Coronavirus Associated with Human Respiratory Disease in China. *Nature* 2020;579: 265–269. [<https://doi.org/10.1038/s41586-020-2008-3>]
- [3] Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, et al. Epidemiological and Clinical Characteristics of 99 Cases of 2019 Novel Coronavirus Pneumonia in Wuhan, China: A Descriptive Study. *Lancet*. 2020;395(10223):507-513.
- [4] Gupta A., Madhavan MV, Sehgal K. Extrapulmonary Manifestations of COVID-19. *Nat Med*. 2020; 26, 1017–1032.
- [5] Phua J, Weng L, LL, Egi M, Lim CM, Divatia JV et al. Intensive Care Management of Coronavirus Disease 2019 (COVID-19): Challenges and Recommendations. *Lancet Respir Med*. 2020;8(5):506–17.
- [6.] El-Elimat T, AbuAISamen MM, Almomani BA, Al-Sawalha NA, Alali FQ. Acceptance and Attitudes Towards COVID-19 Vaccines: A Cross-Sectional Study from Jordan. *PLoS One* 2021;16(4): e0250555. [<https://doi.org/10.1371/journal.pone.0250555>]

- [7] Chukwuocha M, Okorie PC, Iwuoha GN, Ibe SN, Dozie IN. Awareness, Perceptions, And Intent to Comply with the Prospective Malaria Vaccine in Parts of South Eastern Nigeria. *BMC Malar J.* 2018;17(1):187. doi: 10.1186/s12936-018-2335-0.
- [8] Tulchinsky TH, Maurice Hilleman: Creator of Vaccines That Changed the World. *Case Studies in Public Health*, 2018;443–470. doi: 10.1016/B978-0-12-804571-8.00003-2. Epub 2018 Mar 30. PMID: PMC7150172.
- [9] Sharma O, Sultan, AA, Ding H, Triggler, CR. A Review of the Progress and Challenges of Developing a Vaccine for COVID-19. *Front in*
- [10] World Health Organization (WHO). Costs of Delivering COVID-19 Vaccine in 92 AMC Countries Updated Estimates from COVAX Working Group on Delivery Costs. World Health Organization. pp 1-27(2021).
- [11] French J, Deshpande S, Evans W, Obregon R. Key Guidelines in Developing a Pre-Emptive COVID-19 Vaccination Uptake Promotion Strategy. *Int J Environ Res Public Health.* 2020;17(16). Epub 2020/08/23. pmid:32823775; PubMed Central PMID: PMC7459701.
- [12] MacDonald NE. Vaccine Hesitancy: Definition, Scope, and Determinants, *Vaccine.* 2015;33(34):4161–4164. pmid:25896383.
- [13] Oyebanji O, Ofonagoro U, Akande O, Nsoforl, Ukenedo C, Mohammed TB et al. Lay Media Reporting of Monkeypox in Nigeria. *BMJ Glob Health* 2019; 4(6):e002019. <https://doi.org/10.1136/bmjgh-2019-002019>
- [14] Kreps SE, Kriner DL. Factors Influencing Covid-19 Vaccine Acceptance Across Subgroups in the United States: Evidence from a Conjoint Experiment. *Vaccine*, 2021;39(24):3250-3258.
- [15] Hajizadeh M. Socioeconomic inequalities in Child Vaccination in Low/Middle-Income Countries: What Accounts for the Differences? *J Epidemiol Commun H.* 2018;72(8):719–725. doi: 10.1136/jech-2017-210296.
- [16] Ilesanmi O, Afolabi, A, Uchendu O. The Prospective COVID-19 Vaccine: Willingness to Pay and Perception of Community Members in Ibadan, Nigeria. *PeerJ*, 2021; 9:e11153. [<https://doi.org/10.7717/peerj.11153>]
- [17] AlShurman, BA, Khan AF, Mac C, Majeed, M, Butt, ZA. What Demographic, Social, and Contextual Factors Influence the Intention to Use COVID-19 Vaccines: A Scoping Review. *Int J Environ Res and Public Health.* 2021; 18(17):9342. [<https://doi.org/10.3390/ijerph18179342>]
- [18] Nwagbara UI, Osual EC, Chireshe R, Bolarinwa OA, Saeed BQ, Khuzwayo N. Knowledge, Attitude, Perception, and Preventative Practices Towards COVID-19 In Sub-Saharan Africa: A Scoping Review. *PLoS One* 2021;16(4): e0249853. doi:10.1371/journal.pone.0249853
- [19] Anorue LI, Ugwu AC, Ugboaja SU, Nwabunze UO, Ugwulor-Onyinyechi CC, Njoku C. Communicating COVID-19 Vaccine Safety: *Immunol.*, 2021;(11): 585354–. doi:10.3389/fimmu.2020.585354
- [20] Mesesle M. Awareness and Attitude Towards COVID-19 Vaccination and Associated Factors in Ethiopia: Cross-Sectional Study. *Infect Drug Resist.* 2021; 14:2193-2199. doi: 10.2147/IDR.S316461. Erratum in: *Infect Drug Resist.* 2021 Jul 06;14:2569. PMID: 34163184; PMID: PMC8214020
- [21] Organisation for Economic Co-operation and Development (OECD). Enhancing Public Trust in COVID-19 Vaccination: The Role of Governments Organisation for Economic Co-Operation and Development. 2021; Pp1- 27
- [22] Solís A, Warren SS., Meriggi NF. COVID-19 Vaccine Acceptance and Hesitancy in Low- and Middle-income Countries. *Nat Med.* 2021; 27: 1385–1394. [<https://doi.org/10.1038/s41591-021-01454-y>]
- [23] Zewude B, Habtegiorgis T. Willingness to Take COVID-19 Vaccine Among People Most at Risk of Exposure in Southern Ethiopia. *Pragmat Obs Res.* 2021;12:37-47. [<https://doi.org/10.2147/POR.S31399>]
- [24] Harapan H, Wagner AL, Yufika A, Winardi W, Anwar S, Gan AK, et al.. Willingness-to-pay for a COVID-19 Vaccine and its Associated Determinants in Indonesia, *Hum Vaccines Immunother.* 2020;(16)12:3074-3080.
- [25] Adigwe, OP. COVID-19 Vaccine Hesitancy and Willingness to Pay: Emergent Factors from a Cross-Sectional Study in Nigeria, *Vaccine:* 2021; X, 9, 100112. <https://doi.org/10.1016/j.jvax.2021.100112>,