Original Research Article

Perception about COVID-19 vaccine among patients at the federal medical centre, Yenagoa, South-South Nigeria

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ABSTRACT

Background: The severe acute respiratory syndrome corona virus-2 (SARS-CoV-2) is the causative organism of the coronavirus disease 2019 (COVID-19), which is a respiratory disease that was first identified in December, 2019 in Wuhan, China. Objective was to determine the perception of the COVID-19 among patients at the Federal Medical Centre, Yenagoa, Bayelsa State, Nigeria.

Methods: This study was carried out at the Federal Medical Centre, Yenagoa between 4th January and 15th February, 2021. It was a descriptive cross-sectional study. The study population consisted of 1,000 consecutive patients that presented to the various out-patients departments of the hospital. Written informed consent was obtained. The data were collected with a predesigned questionnaire, and were analysed using statistical software (SPSS for windows® version 23, SPSS Inc.; Chicago, USA).

Results: Out of 1,000 participants, only a quarter of the participants (24.6%) indicated willingness to take the COVID-19 vaccine when available in Nigeria. About one-tenth of the participants have had loss of sense of taste and smell (11.7%), and think they possibly may have been infected with the COVID-19 (10.8%) in the recent past. Among those that were unwilling to take the COVID-19 vaccine, 14.2%, 9.0% and 7.5% thought that hydroxychloroquine, azithromycin and septrin respectively, are safe alternatives to the vaccine.

Conclusions: Although it is known that hypothetical choices may not always reflect real life decision, it is important for policy makers and stakeholders to pay more attention on health education and campaign, targeted at addressing the misconception about COVID-19 vaccine.

Keywords: COVID-19, COVID-19 vaccine, Perception, Wuhan

INTRODUCTION

The severe acute respiratory syndrome corona virus-2 (SARS-CoV-2) is the causative organism of the coronavirus disease 2019 (COVID-19), which is a respiratory disease that was first identified in December, 2019 in Wuhan, the capital of Hubei province in the People's Republic of China.[1] It was said to have emerged from a livestock market in the city of Wuhan, in China. Since it was first identified in December 2019, it has spread to 188 countries in the world.[2] This was the reason the World Health Organisation declared COVID-19 a global pandemic on March 11, 2020.[3] The second wave of the pandemic is presently ongoing.

In Nigeria, the first case of COVID-19 was discovered on the 27th of February, 2020, when an Italian national tested positive for the virus in Lagos; and since then, the number of cases and deaths have continued to increase. All the states in Nigeria have been affected, and the case fatality rate is presently 1.2% of the total confirmed cases, with 82% recovery rate.[4] The prevalence in Nigeria is 12.2%.[5]

If the world will ever return to normality as far as COVID-19 is concerned, the world's population will have to be immune to SARS-CoV-2. For the general populace to be willing to accept COVID-19 vaccine, then they need to have a good perception about this vaccine. Perception of a vaccine plays an important role in acceptability of the vaccine.[6] Vaccine acceptability and uptake may be influenced by a number of factors which include level of education, understanding, socio-cultural factors, religious factors, ethnicity, access to social media, fear of side effects, personal risk perception, sources of information, accessibility to healthcare facility and level of trust in the healthcare system.

Scientists all over the world are working tirelessly than ever to develop and produce vaccines that can prevent and control the spread of COVID-19. Nigeria has concluded plans to partner with Cuba to produce a COVID-19 vaccine.[7,8] As of December 31, 2020, three new strains of the virus have been detected, and have spread to 13 countries globally.[9] However, none of the variants have been conclusively shown to be more fatal or resistant to treatment or vaccine.
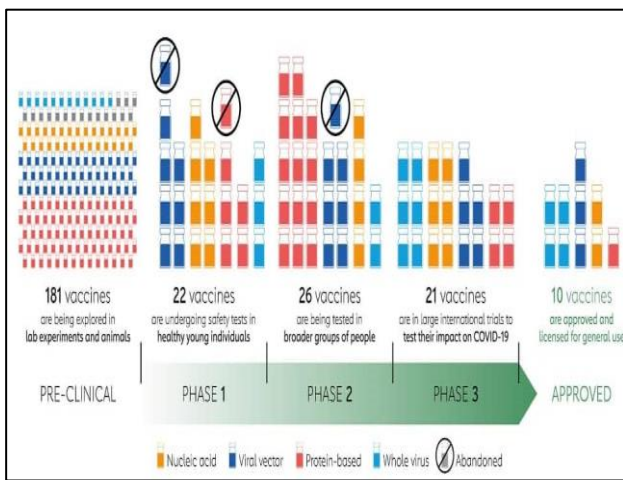

Figure 1: COVID-19 vaccines in development.[10]

Figure 2: COVID-19 vaccines in Phase 3 clinical development around the world.[10]

When vaccines make it to human clinical trials (Figure 1), they first go through phase 1 trials primarily to test the safety of the vaccine, determine dosages and identify any potential side effects in a few people.[10] Phase 2 trials are carried out on larger groups of people. These further evaluate the safety and efficacy of the vaccine. Phase 3 trial (the last stage), which few vaccines ever get to, are carried out on much larger groups of people. The effectiveness and side effects of the vaccines are confirmed and assessed, because rare side effects usually present in larger groups of people. The World Health Organization (WHO) lists different vaccines at various stages of clinical trials (Figures 1 and 2).[10]

Six out of ten children are immune to the COVID-19 virus despite never being infected by it.[11] Immunity triggered by exposure to the coronaviruses that cause the common cold could protect people, especially children, against the SARS-CoV-2 virus. This is called immune cross-reactivity.[11]

Some people who had never been exposed to the new coronavirus were checked for pre-existing antibodies that bind to the spike protein on the surface of the SARS-CoV-2, and if those antibodies had any effect on the way the SARS-CoV-2 infects cells.[11] About 5% out of 302 uninfected adults that participated in the study had antibodies that recognise the SARS-CoV-2.[11] About 62% of uninfected children between 6 and 16 years had antibodies.[11] It is in this age-group that antibodies to seasonal coronaviruses are most prevalent. It was also found that pre-existing antibodies stopped the SARS-CoV-2 from entering the cells.[11]

There two subunits (S_1 and S_2) in the spike protein, and it has been found that S_2 is more common to all coronaviruses, and this is possibly how immune cross-reactivity occurs.[11] This is the reason researchers strongly believe that vaccines will be effective in preventing and controlling the spread of COVID-19.

Children are far more likely than adults to have antibodies against COVID-19.[11] This may be an explanation to why they are often not affected by the SARS-CoV-2 or only have mild illness. It has been suggested that investigating the S_2 subunit could contribute to a universal vaccine against coronaviruses.[11]

With a few vaccines already available, there are pertinent questions that must be answered. These questions include: 1. Can someone who recovered from Covid-19 receive the vaccine? 2. Can someone receive a Covid-19 vaccine after receiving a trial dose of a different vaccine? 3. Can someone receive a booster dose the Covid-19 vaccine after receiving a previous vaccine?

Someone that recovered from COVID-19 can still benefit from vaccination. This is because the previous infection may be so overwhelming that immune response became inadequate and therefore, immunity to COVID-19 was

not produced. Immunity to COVID-19 may also not be produced in mild infections because immune response may not have taken place.

A booster dose of COVID-19 vaccination enhances the quality of the immune response and sends a reminder to the immune system about the virus.[12] It does not matter if the previous vaccine the person received (whether trial or not) is different from the one to be given as booster dose, provided both contain the critical viral protein.[12] A booster dose of a vaccine is a reminder to the immune system to be alert against a particular offender.[12]

Therefore, the objective of this study was to determine the perception of the COVID-19 among patients at the Federal Medical Centre, Yenagoa, Bayelsa State, Nigeria.

METHODS

This study was carried out at all the clinical departments of the Federal Medical Centre (FMC), Yenagoa, Bayelsa State, South-South, Nigeria between 4th January and 15th February, 2021.

It was a descriptive cross-sectional study. The study population consisted of 1,000 consecutive patients that presented to the various out-patients departments at the FMC, Yenagoa for management.

Patients who were eligible were counselled and enrolled in the study after giving a written informed consent. An explanation of the nature of the study and the likely benefits to the patient preceded the administration of written consent.

Inclusion criteria

Patients that presented for all forms of consultation were included in the study.

Exclusion criteria

Critically ill patients at the accident and emergency units and intensive care unit, patients on admission at the various wards in the department, mental health patients, members of staff at the non-clinical departments, and patients who declined consent/incompletely filled consent form were excluded from the study.

The sample size for this study was calculated using the formula:[13]

$$n = \frac{Z^2 pq}{d^2}$$

Where: n = minimum sample size

z = normal standard deviation set at 95% confidence limit = 1.96.

p = prevalence of COVID-19 in a previous study.

q = 1 – p (complementary probability).

d = margin of error = 2% = 0.02.

Prevalence of COVID-19 in a previous study was 12.2%.[5]

Therefore:

p = 0.122

q = 1 – 0.122 = 0.878

$$n = \frac{(1.96)^2 \times 0.122 \times 0.878}{(0.02)^2}$$

n = 3.8416 x 0.122 x 0.878/0.0004

n = 1,028.74

This was rounded up to 1,000.

Therefore, 1,000 patients who met the inclusion criteria were recruited for this study.

Data analysis

Selected patients' data were entered into a predesigned questionnaire. Analyses were done to uncover the distribution of sociodemographic features like age, sex, marital status, religion, etc. among participants. Willingness to receive COVID-19 vaccine and previous experience with COVID-19 infection, why participants are unwilling to receive the vaccine and probable alternatives to the COVID-19 vaccine were also explored among participants.

Categorical variables were expressed in frequencies and percentages while continuous variables were summarized in mean and standard deviation. Results are presented in figures and tables as appropriate. Analysis was done on IBM SPSS 23.0 version after cleaning and checking for completeness of data.

RESULTS

The perception about COVID-19 in this locality was investigated among 1,000 adult who willingly participated in the study. Many people eligible to participate in the study, declined participation due to the erroneous believe that COVID-19 is a scam, expressing their displeasure towards the researchers as being part of the scam.

Some of the people wanted to be induced before taking part in the study, which the researchers declined.

Sociodemographic features of participants

Of the 1,000 people who participated in this study, Table 1 showed that men were about a third (34.9%) and women two-thirds of the study population (65.1%). Majority of the participants were aged between 26 – 35 years (34.6%), married (74.1%), and of the Christian faith (97.3%). Almost half of participants (48.6%) had tertiary level of education as their highest educational attainment.

Table 1: Sociodemographic features of participants.

Characteristics	Frequency (n=1,000)	Percent
Sex		
Male	349	34.9
Female	651	65.1
Age group		
≤25 years	168	16.8
26-35 years	346	34.6
36-45 years	312	31.2
46-55 years	103	10.3
>55 years	71	7.1
Mean age (SD) in years	35.9 (10.6)	
Marital Status		
Single	259	25.9
Married	741	74.1
Religion		
Christian	973	97.3
Islam	18	1.8
None	9	0.9
Educational level		
Primary	40	4.0
Secondary	331	33.1
Tertiary	486	48.6
Postgraduate	143	14.3
Occupation		
Trader	258	25.8
Professional	184	18.4
Artisan	31	3.1
Health worker	107	10.7
Security	41	4.1
Agric	64	6.4
Others	87	8.7
Unemployed	228	22.8
Residence		
Bayelsa	899	89.9
Outside Bayelsa	101	10.1

Willingness to receive COVID-19 vaccine and COVID-19-related information

A quarter of the participants (24.6%) indicated willingness to take the COVID-19 vaccine when available in Nigeria (Figure 3).

Table 2 revealed that 1.9% of the participants have tested positive for COVID-19, 4.4% have lost a relative to COVID-19, and 6.3% think they have had contact with someone with the COVID-19. About one-tenth of the participants have had loss of sense of taste and smell (11.7%), and think they possibly may have been infected with the COVID-19 (10.8%) in the recent past.
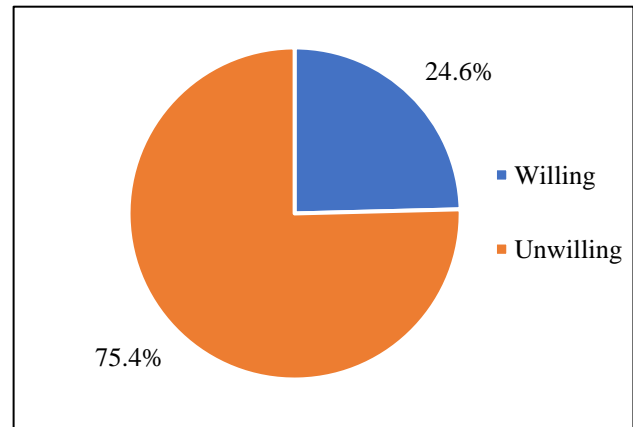
Figure 3: Willingness to receive COVID-19 vaccine.

Table 2: COVID-19-related information.

Information	Frequency (n=1000)	Percent
More than one option applies		
Participants have tested positive for COVID-19	19	1.9
Lost sense of taste and smell in the recent past	117	11.7
Possibly infected with COVID-19	108	10.8
Has had contact with someone with COVID-19	63	6.3
Has lost a relative to COVID-19	44	4.4

Participants' perception and reasons for unwillingness to receive COVID-19 vaccine

Concerns around trust were the most popularly expressed reasons seven hundred and fifty-four participants were unwilling to take the COVID-19 vaccine (Table 3). About 2 out of every 5 participants who are unwilling to take the vaccine said they do not trust the manufacturers of the vaccine (43.4%) and/or do not trust the government (41.8%). Other reasons for the unwillingness include perception that the vaccine is unsafe (31.7%), the vaccine has not gone through enough clinical trials (23.2%) and the vaccines will have side effects (20.2%).

Perceptions influenced by religion (6.9%) and affordability (2.7%) were not common among the respondents.

Table 3: Participant's perception and reasons for unwillingness to receive COVID-19 vaccine.

Probable reasons for unwillingness	Frequency (n=754)	Percent
The vaccine is unsafe	239	31.7
The vaccine will not work	73	9.7
I do not trust the manufacturers	327	43.4
I do not trust the government	315	41.8
The vaccine is a mark of the beast	71.4	9.4
The vaccine is to reduce the world population	94	12.5
The vaccine can make one sick	151	20.0
The vaccine has not gone through enough clinical trials	175	23.2
I might not be able to afford the vaccine	90	11.9
I don't have time to take any vaccine	108	14.3
My religion does not allow vaccination	52	6.9
I will take it if I get paid for it	20	2.7
I have other medical condition(s) that would not allow me to take it	69	9.2
The vaccines we are taking are already too much	41	5.4
The vaccine is not needed because the infection is harmless	52	6.9
The vaccines will have side effects	152	20.2
There are other alternative treatments, so vaccine is not needed	130	17.1

*Note - Respondents can select more than one options.

Table 4: Preferred alternative to COVID-19 vaccine among study participants.

Preferred alternatives to COVID-19 vaccine	Frequency (N=1,000)	Percent
Aware of ivermectin as a medication against COVID-19	90	9.0
Has taken ivermectin as prophylaxis/treatment for COVID-19	11	1.1
Believe ivermectin is a safe alternative to COVID-19 vaccine	54	5.4
Prefers to take ivermectin instead of COVID-19 vaccine	60	6.0
Aware of colchicine as a medication against COVID-19	20	2.0
Has taken colchicine as prophylaxis/treatment for COVID-19	-	
Believe colchicine is a safe alternative to COVID-19 vaccine	-	
Prefers to take colchicine instead of COVID-19 vaccine	20	2.0
Aware of septrin as medication against COVID-19	215	21.5
Has taken septrin as prophylaxis/treatment for COVID-19	56	5.6
Believe septrin is a safe alternative to COVID-19 vaccine	75	7.5
Prefers to take septrin instead of COVID-19 vaccine	54	5.4
Aware of hydroxychloroquine as a medication against COVID-19	481	48.1
Has taken hydroxychloroquine as prophylaxis/treatment for COVID-19	92	9.2
Believes hydroxychloroquine is a safe alternative to COVID-19 vaccine	142	14.2
Prefers to take hydroxychloroquine instead of COVID-19 vaccine	143	14.3
Aware of azithromycin as a medication against COVID-19	218	21.8
Has taken azithromycin as prophylaxis/treatment for COVID-19	99	9.9
Believe azithromycin is a safe alternative to COVID-19 vaccine	90	9.0
Prefers to take azithromycin instead of COVID-19 vaccine	109	10.9

Preferred alternative treatment to COVID-19 vaccine

As presented in Table 4, 14.2%, 9.0% and 7.5% thought that hydroxychloroquine, azithromycin and septrin respectively, are safe alternatives to COVID-19 vaccine. Almost one-tenth of the participants have used azithromycin (9.9%), and hydroxychloroquine (9.2%) as prophylaxis/treatment for COVID-19.

DISCUSSION

Understanding the perception about vaccine is crucial during a global pandemic. Across all countries surveyed by John et al between March and September 2020, a substantial proportion of participants (up to 63% in some studies) said that they would accept a COVID-19 vaccine if available.[14] Omolefe et al in a study done in Nigeria revealed that 58.2% of participants were willing to take a

COVID-19 vaccine when available.[15] These values are higher than the finding in our study where 24.6% of the participants were willing to be vaccinated. This poor perception about the COVID-19 vaccine is a cause for concern.

Issues bordering around trust were the most popularly expressed reasons. Out of the 75.4% of participants that were unwilling to take the COVID-19 vaccine, 43.4% did not trust the manufacturers of the vaccine and 41.8% did not trust the Government. This shows that trust is strongly associated with vaccine acceptance, and can contribute to reduced public compliance and uptake of the vaccine when available here.

Concerns about safety (31.7%), efficacy (9.7%) and affordability (11.7%) were also noted in our study. This was lower than the 72.6%, 71.2% and 82.0% respectively reported in China by Yulan et al.[16] In terms of affordability; with the launching of COVAX in response to COVID-19 pandemic, the divide between the rich and the poor countries (that are unable to purchase the COVID-19 vaccine) will be significantly reduced. On February 24, 2021, Ghana became the first country to receive the AstraZeneca/Oxford COVID-19 vaccine through COVAX.[17]

About 9.4% of the participants in this study were not willing to receive the COVID-19 vaccine due to their belief that the COVID-19 vaccine represents 'a mark of the beast', and about 12.5% of the participants opined that the reason for the COVID-19 vaccination is to reduce the global population of people. Omolefe et al had similar findings in their study.[15]

About 175 (23.2%) participants were unwilling to take the COVID-19 vaccine due to the belief that the vaccine has not gone through enough clinical trials and about 152 (20.2%) participants were unwilling to be vaccinated due to perceived side effects. This is similar to findings in a study by Thunstrom where they noted that distrust of vaccine safety and vaccine novelty were among the most important drawbacks to COVID-19 vaccination.[18]

There are four COVID-19 vaccine types in development-whole virus, protein unit, nucleic acid and viral vector. Apart from the AstraZeneca/Oxford viral vector vaccine, some other COVID-19 vaccines that have been approved include Pfizer/BioNTech RNA vaccine, Moderna RNA vaccine, and Janssen/Johnson and Johnson viral vector vaccine.[10] With the present COVID-19 vaccines and more undergoing clinical trials, the COVID-19 pandemic will soon be in the past.

Out of the 75.4% of the participants that were not willing to receive the COVID-19 vaccine, about 130 (17.1%) of them had the perception that alternative treatment such as the use of ivermectin, Colchicine, hydroxychloroquine, azithromycin and septrin could significantly replace the COVID-19 vaccine. Therefore, receiving COVID-19 vaccine was out of place. This perception was buttressed by a survey conducted by Babalola and his colleagues which reported that intravenous ivermectin be taken into consideration for use in clinical management of COVID-19, and may be useful in prophylaxis in high-risk regions of the world.[19]

Limitations

This was a hospital-based study. The results here may not reflect same in other tertiary institutions in Nigeria and around the world.

CONCLUSION

Although it is known that hypothetical choices may not always reflect real life decision, it is important for policy makers and stakeholders to pay more attention on health education and campaign, targeted at addressing the misconception about COVID-19 vaccine. This will go a long way in improving the anticipated low COVID-19 vaccine uptake. Further researches should be carried out to determine how effectively the poor perception about COVID-19 vaccine among the people can be solved.

ACKNOWLEDGEMENTS

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