Compliance with Covid-19 Non-Medicinal Preventive Protocol and Intent to Accept Covid-19 Vaccine Among Adults in South Eastern Nigeria

UGONMA Dozie (✉️ ugonmadozie@gmail.com)  
Federal University of Technology Owerri  

Sally Ibe  
Federal University of Technology Owerri  

Chidozie Nwaokoro  
Federal University of Technology Owerri  

Uchechukwu Chukwuocha  
Federal University of Technology Owerri  

Obinna Udujih  
Federal University of Technology Owerri  

Chinaecherem Innocent  
Federal University of Technology Owerri  

Nosike Simplicius Dozie  
Federal University of Technology Owerri  

Chinyere Nwufo  
Federal University of Technology Owerri  

Nneji Onyewu  
Nefamz Solution Provider, Washington D.C, United States of America  

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Abstract

Background

A Non-pharmaceutical public health measures are being promoted for mitigating the risk and impact of epidemic and pandemic covid-19 influenza and the introduction of its vaccine necessitate the assessment of individual perception regarding the vaccine. This study assessed compliance with covid-19 non-medicinal preventive protocol and intent to accept covid-19 vaccine among adults in Owerri West, Imo state Nigeria.

Method

Descriptive cross sectional research design was employed in recruiting four hundred and thirty six (436) participants used for the study. Using SPSS version 23, data were subjected to descriptive and Chi-square analysis.

Results

Results showed that almost all of them 433(99%) have heard about covid-19 especially from radio 151(35%). A vast number of them know the cause of the disease 397(92%) and when and where it was first reported 423(98%). They were aware that the disease is transmitted through respiratory droplet 351(81%) and it can enter the body through the nose 400(92%), mouth 359(83%) and eyes 362(84%). Moreover, almost all of them know that the disease has no cure 398(92%). On their perception, majority of them strongly agreed that the disease is real and is a serious disease but not in Nigeria where most of the participants disagreed that people did not die from the disease 303(69%). Most of them strongly perceived that the disease can be prevented through regular washing of hands with soap 291(67%), maintaining social distance 223(51%), wearing of nose mask 204(47%), cleaning and disinfecting the environment 231(53%). However, most of them sometimes wear nose mask wash their hands with soap 298(68%) and maintain at least one meter distance when with others 283(65%). Equally, the participants sometimes wash cloth nose mask before reuse 288(66%) but never share nose mask with any other person 200(46%). Moreover, most of them sometimes touch face with fingers 231(53%), clean and disinfect door handles 258(59%), tables and chairs 252(58%). Most of them sometimes sneeze/cough into their elbow 244(56%) and dispose tissue paper used for sneezing/coughing into a closed bin 325(75%), travel in a crowded vehicle 244(56%), attend events with more than 50 persons in attendance 189(43%) and in general sometimes follow all the recommended preventive measures 259(59%) resulting in greater proportions of them 197(45%) observing low level of compliance. Major barrier for not observing the preventive measures as reported by majority of the respondents is that hand washing with soap for up to 20 minutes is lack of time 203(47%), feel uncomfortable with wearing of nose mask 180(41%), attend crowded events because it is very crucial 167(38%) and usually touch their face when cleaning sweat 178(41%). Only few of the participants 114(26%) were willing to accept vaccine especially if it given free of charge 151(35%) in liquid form 55(48%) and its safety trusted 352(81%). Prominent reason for not taking vaccine was because of hidden agenda behind it which is not to the advantage of humanity 87(27%) whereas prominent reason for accepting it was to prevent the recipient from getting the disease 88(77%).
Conclusion

With the exception of religion, all the demographic characteristics had significant influence (p<0.05) on the level of compliance to covid-19 preventive measures and respondents’ intent to accept covid-19 vaccine when provided. Therefore, to increase vaccine acceptability, baseless rumors and myths against the COVID-19 vaccines must be checked and they should be reached out with scientific facts describing the safety and efficacy of the vaccines.

Introduction

It has been just over a year since the first cases of the Coronavirus SARS-CoV-2, leading to the disease COVID-19, have been identified. Over this period, much has changed in terms of knowledge about the virus and its management. It has, indeed, been a steep learning curve for all involved (1). The alarming spread of the coronavirus disease and its attendant impacts on the global economy calls for concern. The non-availability of the vaccine makes the situation more challenging. Since the first case was reported in late 2019, it has remained a serious issue in the public health domain. This is particular in Africa where the absence of good health facilities and rising population increase the risk of disease. Coronavirus disease 2019 (COVID-19) outbreak was first noticed in Hubei Province, Wuhan, China in 2019 and has spread to virtually all parts of the world. It has so far affected 123 countries in the world, infecting fourteen million six hundred and seventy-four thousand, six hundred and eighteen (14,674,666) people and resulting into six hundred and nine thousand, six hundred and eighteen (609,618) deaths worldwide (2) (Worldmeter, 2020). The World Health Organization (WHO) declared the disease a public health emergency (3). Nigeria is categorized as one of the 13 high-risk African countries based on the poor state of healthcare system in the country (4). As of May 25, 2020, Nigeria reported about 7,839 confirmed cases and 226 related deaths (3).

Covid-19 is a disease that affects the respiratory tract and is caused by a newly emergent coronavirus, SARS-CoV-2, which was first noticed in Wuhan, China (5). Coronaviruses are minute in size (65 – 125 mm in diameter) and contain a single stranded DNA, with size ranging from 26 to 32kbs in length. The coronaviruses families include alpha, beta, gamma and delta coronaviruses (6). People who have the disease show mild or uncomplicated illness. However, about 14 per cent of the people with Covid-19 develops severe illnesses that requires hospitalization and oxygen support and 5 per cent needing admission in intensive care unit. Based on available evidence, coronavirus is basically transmitted from one person to another through respiratory droplets and contact routes (3). Droplet transmission occurs when a person is in close contact (within 1 m) with someone who has respiratory symptoms (e.g. coughing or sneezing) and is therefore at the risk of exposing his/her mucus (mouth and nose) or conjunctiva (eyes) to potentially respiratory droplets. Thus, transmission of coronavirus can occur directly by contact with infected people and indirectly through contact with infected surfaces (3). In cases that are serious, diseases like acute respiratory disease syndrome (ARDS), sepsis and septic shock, multiorgan failure including acute kidney and cardiac injury can cause complications (6).

The pandemic has adversely impacted Africa in several ways. According to the (7), it has reduced the demand for Africa's commodities, capital flight, poor performance of tourism and aviation industries with lockdowns and closure of borders; and depreciation of local currencies. Also, the pandemic has reduced the gross
domestic product of many countries in the African continent. The African Union Commission (8), predicts a negative growth from 3.4% to between 0.8% to – 1.1%. Similarly, in the sub-Saharan African region, the GDP is expected to decline sharply from 2.4% in 2019 to between – 2.1% and – 5.1% in 2020 (9). In Nigeria, the pandemic is reported to have caused declining consumption, declining investment, increasing government expenditure and declining net exports. Restriction of movements has not only reduced the consumption of nonessential commodities but have affected the income-generating capacity of these groups, thereby reducing their consumption expenditure (10).

No cure has been discovered for Covid-19 disease despite myriads of efforts and claims, thus making adoption of preventive measures very important. (11). stated that preventive measures can save at least 20 million lives and when they are adopted early enough would save up to 38.7 million lives globally. Therefore, enforcing these measures remains a great challenge to human society. Compliance with preventive measures has significantly helped in the control of the pandemic in many countries. For example, many Americans were subjected to a stay-at-home measure (12) to check the spread of the disease. Similarly, in Nigeria and other countries, related measures were also undertaken in order to curtail the spread of the disease. According to (13), certain factors such as perceived threat, moral beliefs, negative emotions, practical capacity to comply and descriptive social norms influenced compliance to preventive measures.

Prevention means averting the development of a pathological state. According to World Health Organization (14) it covers measures not only to prevent the occurrence of a disease such as risk factor reduction, but also to arrest its progress and reduce its consequences once established. The Australian National Public Health Partnership defined prevention as action to reduce or eliminate the onset, causes, complications or recurrence of diseases (15). Preventive measures against disease outbreak promote health and prolong life through organized efforts of society. Prevention stops disease progression by reducing exposure to environmental hazards related to the disease. Prevention can be primordial (preventing the predisposing social and environmental) primary, secondary and tertiary to improve function, minimize impact and delay complications (14). Certain measures have been deployed to check the spread of the disease. Some of the preventive measures include washing of hands, coughing etiquette, use of face masks, avoidance of public gathering, restrictions on movement, disinfection, use of alcohol-based sanitizers, vaccination as well as public health measures.

In Nigeria, several measures have been taken to prevent, mitigate and respond to the spread of Covid-19 (16). Vaccines have been a successful measure of disease prevention for decades (17)(Vaccines and immunization, 2020). Numerous channels have as well been utilized in communicating the measures among the people. The assumption has been that those measures are strictly complied with. However, the pandemic continues to spread as a second wave of the outbreak is recorded in the country. Observations have revealed the non-compliance and wrong application of the measures, making them counterproductive. Moreover, the second wave of Covid-19 outbreak is expected to ravage developing countries, exacerbating the already strained economic conditions. ACAPS (16) noted that clarity is lacking on the containment measures against Covid-19 among rural communities in Nigeria. It further maintained that the type of Covid-19 preventive measures, their degree of implementation and the populations’ compliance varies across states and regions. Research has shown that lack of knowledge is the major reason for non-adherence to precautions against diseases (18). Moreover, vaccine hesitancy and refusal are significant concerns globally, prompting the World
Health Organization (WHO) to declare this uncertainty among the top 10 health threats in 2019 (19). The causes of vaccine hesitancy, as reported in different studies, include religious reasons, personal beliefs, and safety concerns due to wide-spread myths, including the association of vaccines and autism, brain damage, and other conditions (20).

Literature review revealed that no study has determined the compliance and non-compliance to preventive measures against Covid-19 in Imo State, Nigeria and to the best of our knowledge, no previously published work has evaluated the intent of people in Imo State to be vaccinated against COVID-19 when a vaccine is provided. This creates a gap in knowledge which may stall policy formulation against the spread of the disease. The study was therefore designed to determine compliance with covid-19 non-medicinal preventive protocol and intent to accept covid-19 vaccine among adults in Owerri West, Imo state Nigeria.

2.1 Area Of Study

Owerri West is a Local Government Area of Imo State, Nigeria. Its headquarters are in the town of Umuguma. Owerri West Local Government is administered under the terms of the Constitution of the Federal Republic of Nigeria. Owerri West was carved out of the former Owerri Local Government Area in 1996. A very large portion of the local government constitutes the capital city of Imo State, Nigeria. Owerri West is made up of the Following Communities Denoted to be fifteen in Number Umuguma town, Avu, Okuku, Oforola, Obinze, Nekede, Ihiagwa, Eziobodo, Okolochi, Emeabiam, Irete, Orogwe, Amakohia, Ndegwu and Ohii. Prominent locations in Owerri West include; Federal Polytechnic Nneke, Owerri (FPNO), Federal University of Technology Owerri (FUTO) located at Ihiagwa and Eziobodo as the two major host communities with Okolochi, Obinze and Emeabiam as the minor host communities. Nekede Zoo, Nekede Divisional Police, Federal Secretariat located at Umuguma along Port Harcourt Road, State Secretariat General Hospital Umuguma, World Bank Housing Estates Umuguma, Area L, M, N, Federal Housing Estate Umuguma, Imo State Housing Estate Umuguma and Concorde Hotel. The Owerri West Local Government Headquarters is situated at the heart of Umuguma community by the central market square. Owerri West Local Government Constitutes mainly of Igbo people situated in her Residential territories as well as other minor ethnicities. It has an area of 295 km² and a population of 99,265 at the 2006 census (21). The Coordinates of Owerri West is given as 5.4166° N, 6.9853° E.

2.2 STUDY DESIGN

A descriptive Cross sectional Research design was employed on the course of this study on compliance with covid-19 non-medicinal preventive protocol and intent to accept covid-19 vaccine among adults in Owerri West, Imo state Nigeria.

2.3 STUDY POPULATION

This study on the covid-19 and compliance with non-medicinal preventive protocol among adults in Owerri West Imo State was targeted at adults aged 18yrs and above at Owerri west LGA.

2.3.1 Inclusion criteria
Only adult household residents aged 18yrs and above at Owerri west LGA were recruited for the study.

3.3.2 Exclusion criteria

Adult household residents aged 18yrs and above in Owerri West LGA who refused to give in their consent for the study were excluded from the study.

2.4 SAMPLING

2.4.1 Sample size Determination

The sample size will be determined using the (22) Taro formula (1967) for sample size determination.

\[ n = \frac{N}{1 + Ne^2} \]

Where:

n is the desired sample size

N is the population size (20,389)

e is margin of error (0.05)

Therefore,

\[ n = 392.30362210 \]

Furthermore, to adjust for a 10% rate of non response and invalid response (i.e 90% expected response rate =0.9).

\[ n = n / \text{expected response rate} \]

\[ n = 362 / 0.90 = 435.5 \]

\[ n = 436. \]

2.4.2 Sampling Techniques

A Multi stage sampling method was adopted for this study.

First stage: *Selection of Communities*

Three (3) Out of the fifteen(15) Communities in Owerri west were selected by the researcher using simple random sampling via balloting to give every community an equal chance of selection of which Ihiagwa, Obinze and Eziobodo was selected by the researcher.

Second stage: *Selection of villages*
Two (2) villages each out of the total number of villages in Ihiagwa, Obinze and Eziobodo community respectively were selected via simple random sampling using balloting.

**Third stage:** Selection of Streets

A total of five (5) streets each in the selected Six (6) villages were selected via simple random sampling (balloting) to give every street an equal chance of being selected.

**Fourth stage:** Selection of households

A systematic probability sampling method was used to select each household in the selected streets giving each household an equal chance of selection.

**Fifth stage:** Selection of Respondents

The researcher selected any adult of each household or any one present at the time of study. Selection of respondents was done via simple random sampling.

2.5 The instrument for data collection consists of a semi-structured self-administered questionnaire which was administered on the 436 respondents. The structured questionnaire was validated using face-validity. Pre testing was carried out on 40 respondents in Ihiagwa Metropolis in Owerri West LGA as a trial run for the main research intended. Cronbach's Alpha was used to determine the internal consistency and degree of relationship of the test item. Prior to administration of the questionnaire to the respondents, an informed consent was obtained. Ethical clearance was obtained from the ethical review committee of School of Health Technology, Owerri. Verbal informed consent was obtained from all the participants before being allowed to participate in the study. Each of the respondents was assured of confidentiality of the information she might volunteer. Each questionnaire took about 5-10 minutes to be completed.

2.6 Ethical issues

The research followed the tenets of the Declaration of Helsinki. Ethical approval was given by the Ethical Committee of the School of Health Technology, Federal University of Technology Owerri, Nigeria. Informed verbal consent was sought and obtained from all the participants before they could take part in the study.

2.7 Method of data analysis

Data collected were analyzed using frequency, mean and Chi-Square. This was achieved using Statistical Package for Social Sciences (SPSS) version 21. Chi square was used to determine the influence of demographic characteristics on compliance to covid-19 preventive measures and intent to accept covid-19 vaccine.

3.0 Results

3.1 Socio-demographic characteristics of the respondents

As shown in Table 1, majority of the respondents 107(25%) were within 32-41 years age group. Most of them 281(64%) are male compared to their female counterparts 155(36%). A reasonable number of them 195(45%)
were single compared to those that were married 169(39%), co-habitng 52(12%) and separated/divorced 20(5%). A larger proportions 216(%) were not having any child as of the time of the study. Moreover, those with secondary school certificate 301(69%) and who were unemployed 98(22%) constituted the vast of the respondents. Almost all of them 399(92%) were Christians as shown in figure 1.

Table 1: Socio-demographic characteristics
| Variables                | Frequency | Percentage |
|--------------------------|-----------|------------|
| **Age (years)**          |           |            |
| 12 – 21                  | 53        | 12         |
| 22 – 31                  | 56        | 13         |
| 32 – 41                  | 107       | 25         |
| 42 – 51                  | 97        | 22         |
| 52 – 61                  | 73        | 17         |
| 62 – 71                  | 33        | 8          |
| 72 and above             | 17        | 4          |
| **Total**                | **436**   | **100**    |
| **Gender**               |           |            |
| Male                     | 281       | 64         |
| Female                   | 155       | 36         |
| **Total**                | **436**   | **100**    |
| **Marital status**       |           |            |
| Single                   | 195       | 45         |
| Married                  | 169       | 39         |
| Separated/ Divorced      | 20        | 5          |
| Co-habiting              | 52        | 12         |
| **Total**                | **436**   | **100**    |
| **Number of alive children** |       |            |
| None                     | 216       | 50         |
| 1 – 2                    | 85        | 19         |
| 3 – 4                    | 81        | 19         |
| 5 – 6                    | 34        | 8          |
| 7 and above              | 20        | 5          |
| **Total**                | **436**   | **100**    |
| **Highest educational level** |     |            |
| Primary level            | 56        | 13         |
| Secondary level          | 301       | 69         |
### 3.2 Knowledge of COVID-19

Results of Table 2 showed that almost all the participants 433 (99%) have heard about COVID-19 and it was mainly heard from radio 151 (35%) than other sources. A vast number of them 423 (98%) know that China was the first place the disease was reported. Equally, almost all of them know the cause of it to be microorganism called corona virus compared to fewer that attributed the cause to malaria fever 15 (3%), other causes 13 (3%), witch craft 5 (1%) and typhoid 3 (1%). In addition, almost all of them 398 (%) were aware that COVID-19 has no cure (figure 2). Also in figure 2, almost all the participants know that corona virus can enter the body through nose 400 (92%), mouth 359 (83%) and eye 362 (84%). Equally, many of them 351 (81%) know that respiratory droplets is the main route of transmission of the disease. Nevertheless, greater proportions of them 319 (%) have not seen anyone who suffered the disease 316 (72%) nor died of it 319 (73%) (figure 3).

#### Table 2: Knowledge of COVID-19

| Occupation                        | Tertiary level | 79 | 18 |
|-----------------------------------|----------------|----|----|
| Total                             | 436            | 100|
| Occupation                        |                |    |    |
| None                              | 98             | 22 |
| Student                           | 92             | 21 |
| Public/Civil Servant              | 27             | 6  |
| Artisan                           | 62             | 14 |
| Trading/Small and Medium Enterprise| 91             | 21 |
| Farmer                            | 26             | 6  |
| Company executive                 | 1              | 0  |
| Others                            | 39             | 9  |
| Total                             | 436            | 100|

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| Occupation                        | Tertiary level | 79 | 18 |
|-----------------------------------|----------------|----|----|
| Total                             | 436            | 100|
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| None                              | 98             | 22 |
| Student                           | 92             | 21 |
| Public/Civil Servant              | 27             | 6  |
| Artisan                           | 62             | 14 |
| Trading/Small and Medium Enterprise| 91             | 21 |
| Farmer                            | 26             | 6  |
| Company executive                 | 1              | 0  |
| Others                            | 39             | 9  |
| Total                             | 436            | 100|
| Variables                                      | Frequency | Percentage |
|------------------------------------------------|-----------|------------|
| **Heard about COVID-19**                       |           |            |
| Yes                                            | 433       | 99         |
| No                                             | 3         | 1          |
| **Total**                                      | 436       | 100        |
| **Source of information about what Corona virus or COVID-19 is** |           |            |
| Radio                                          | 151       | 35         |
| Television                                     | 89        | 21         |
| Social media                                   | 122       | 28         |
| Health workers                                 | 20        | 5          |
| Non-governmental Organization (NGO)            | 5         | 1          |
| Family and friends                             | 46        | 11         |
| **Total**                                      | 433       | 100        |
| **Corona virus was first reported in 2019 in**  |           |            |
| China                                          | 423       | 98         |
| America                                        | 5         | 1          |
| England                                        | 2         | 0          |
| Nigeria                                        | 0         | 0          |
| Others                                         | 3         | 1          |
| **Total**                                      | 433       | 100        |
| **Cause of COVID-19**                          |           |            |
| Micro-organism called corona virus             | 397       | 92         |
| Witchcraft                                     | 5         | 1          |
| Malaria fever                                  | 15        | 3          |
| Typhoid fever                                  | 3         | 1          |
| Others                                         | 13        | 3          |
| **Total**                                      | 433       | 100        |

3.3 Respondents’ perception about covid-19
Results of the participants level of perception about covid-19 are shown in Table 3 where majority of them 285(65%) perceived that covid-19 is real. Greater proportions of them 288(66%) strongly perceived the disease to be a serious one but strongly disagreed that anybody, no matter their social status can suffer it 292(67%). However, many of them 240(55%) perceived the disease to be preventable but disagreed 303(69%) that some of those infected with the disease in the country have died. Moreover, a majority of the participants strongly perceived that regular washing of hands with soap 291(67%), maintaining of social distancing 223(51%), wearing of nose mask 204(47%) as well as cleaning and disinfecting the environment 231(54%) can prevent one from getting covid-19.

**Table 3: Individual’s perception about covid-19**

| STATEMENT                                      | SA       | A         | D         | SD        | Total | \( \chi^2 \) | p-value  |
|------------------------------------------------|----------|-----------|-----------|-----------|-------|-------------|----------|
| COVID-19 is real                               | 285(65%) | 66(15%)   | 58(13%)   | 27(6%)    | 436   | 386.7       | < 0.001  |
| COVID-19 is in Nigeria                         | 86(20%)  | 61(14%)   | 241(55%)  | 48(11%)   | 436   | 219.98      | < 0.001  |
| Corona Virus Disease is a serious disease      | 288(66%) | 79(18%)   | 44(10%)   | 25(6%)    | 436   | 405.71      | < 0.001  |
| Anybody, no matter the social status can suffer COVID-19 | 35(8%)   | 46(11%)   | 63(14%)   | 292(67%)  | 436   | 413.3       | < 0.001  |
| COVID-19 can be prevented                       | 240(55%) | 178(41%)  | 12(3%)    | 6(1%)     | 436   | 384.77      | < 0.001  |
| Some of those with COVID-19 in Nigeria have died | 31(7%)   | 49(11%)   | 303(69%)  | 53(12%)   | 436   | 462.9       | < 0.001  |
| Regular washing of hands with soap can prevent COVID-19 | 291(67%) | 85(19%)   | 42(10%)   | 18(4%)    | 436   | 426.33      | < 0.001  |
| Maintaining social distancing (not staying close to people) can prevent getting COVID-19 | 223(51%) | 157(36%)  | 34(8%)    | 22(5%)    | 436   | 261.41      | < 0.001  |
| Wearing of nose mask can prevent getting COVID-19 | 204(47%) | 142(33%)  | 57(13%)   | 33(8%)    | 436   | 170.59      | < 0.001  |
| Cleaning and disinfecting the environment can prevent getting COVID-19 | 231(53%) | 129(30%)  | 39(9%)    | 37(8%)    | 436   | 232.73      | < 0.001  |

Key: SA=strongly agree, A= agree, D=disagree, SD= strongly disagree.

**3.4 Preventive practices of covid-19**
Displayed in Table 4 are the results of preventive practices of the participants where there was a significant association \((p<0.001)\) between respondents’ perception and prevention measures of covid-19. It was shown that sometimes, greater proportions of them practice hand washing 226(52\%) and washes their hands with soap for up to 20 seconds 298(68\%). Sometimes when sneezing/coughing, most of them do that into their elbow 244(56\%) and maintain at least one meter distance when they are with others 283(65\%). Equally, majority of the 205(47\%) sometimes wear nose mask when going out. In addition, most of them use disposable face mask which they never disposed after using it once 344(79\%) but sometimes prefer to wash and reuse them 288(66\%). Majority of the participants sometimes wash their hands before and after placing on these nose masks 281(64\%). Results of Table 4 also showed that less than half of them 200(46\%) never shared nose mask. Sometimes, most of the respondents clean and disinfect door handles 258(59\%) as well as tables and chairs 252(58\%). Equally, majority of them 231(53\%) sometimes touch their face with their fingers and after sneezing/coughing dispose used tissue into a closed bin 325(75\%). It was also shown that most of them sometimes travel in a crowded vehicle 244(56\%), attend events with more than 50 persons in attendance 189(43\%) and in general, most of them 259(59\%) perceived that they sometimes follow all the recommended covid-19 preventive practices. Overall, fig 4 showed that level of compliance to preventive measures was low as observed in almost half of the participants 197 (45\%).

**Table 4: Preventive practices of covid-19**
### Questionnaire Results

| Question                                                                 | ALWAYS | SOMETIMES | NEVER | Total | $\chi^2$ | p-value |
|--------------------------------------------------------------------------|--------|-----------|-------|-------|---------|---------|
| Frequency of handwashing                                                 | 131(30%) | 226(52%) | 79(18%) | 436(100%) | 76.46 | < 0.001 |
| Wash hands with soap for upwards of 20 seconds                          | 87(20%) | 298(68%) | 51(12%) | 436(100%) | 245.01 | < 0.001 |
| Sneeze or cough into your elbow                                          | 9(22%) | 244(56%) | 97(22%) | 436(100%) | 100.49 | < 0.001 |
| Maintain at least one metre distance when you are with others           | 76(17%) | 283(65%) | 77(18%) | 436(100%) | 195.61 | < 0.001 |
| Wear nose mask when going out of the house                               | 165(38%) | 205(47%) | 66(15%) | 436(100%) | 70.46 | < 0.001 |
| Use disposable nose mask only once before discarding it                 | 32(7%) | 60(14%) | 344(79%) | 436(100%) | 410.06 | < 0.001 |
| Wash cloth nose mask before reuse                                       | 85(19%) | 288(66%) | 63(14%) | 436(100%) | 211.74 | < 0.001 |
| Wash hands before and after placing on the nose mask                     | 87(20%) | 281(64%) | 68(16%) | 436(100%) | 191.21 | < 0.001 |
| Share nose mask with any other person                                   | 101(23%) | 135(31%) | 200(46%) | 436(100%) | 123.25 | < 0.001 |
| Clean and disinfect door handles                                        | 69(16%) | 258(59%) | 109(25%) | 436(100%) | 136.52 | < 0.001 |
| Clean and disinfect tables and chairs                                   | 81(19%) | 252(58%) | 103(24%) | 436(100%) | 119.1 | < 0.001 |
| Touch face with fingers                                                  | 82(19%) | 231(53%) | 123(28%) | 436(100%) | 81.53 | < 0.001 |
| Dispose tissue paper used for sneezing/coughing into a closed bin       | 78(18%) | 325(75%) | 33(8%) | 436(100%) | 340.13 | < 0.001 |
| Travels in a crowded vehicle                                            | 141(32%) | 244(56%) | 51(12%) | 436(100%) | 128.34 | < 0.001 |
| Attends events with more than fifty (50) persons in attendance          | 101(23%) | 189(43%) | 146(33%) | 436(100%) | 26.65 | < 0.001 |
| Follow all the recommended preventive practices                          | 59(14%) | 259(59%) | 118(27%) | 436(100%) | 145.33 | < 0.001 |

### 3.5 Barriers to taking preventive measures

As presented in Table 5, lack of time was the major reason given by most 203(49%) of the participants for not washing their hands frequently with soap for up to 20 minutes and feeling uncomfortable with the face mask.
was the main reason for not wearing it 180(41%). the importance of events was noted to be the major reason most of the participants 167(38%) attend crowded events. Equally, a vast proportion of them do touch their face because of cleaning sweat 178(41%).

Table 5: Barriers to taking preventive action

| Variables                                      | Frequency | Percentage |
|------------------------------------------------|-----------|------------|
| **Reason for not washing hand frequently with soap for up to 20 minutes** |           |            |
| Scarcity of water                             | 114       | 26         |
| Not necessary                                  | 50        | 11         |
| Lack of time                                   | 203       | 47         |
| Others                                         | 69        | 16         |
| **Total**                                      | 436       | 100        |
| **Reason for not wearing nose mask**           |           |            |
| Cost of nose mask                              | 103       | 24         |
| Feels suffocating with it                      | 124       | 28         |
| Feels uncomfortable with it                    | 180       | 41         |
| Others                                         | 29        | 7          |
| **Total**                                      | 436       | 100        |
| **Reason for attending crowded events**        |           |            |
| To socialize                                   | 100       | 23         |
| To catch fun                                   | 140       | 32         |
| Very crucial event                             | 167       | 38         |
| Others                                         | 29        | 7          |
| **Total**                                      | 436       | 100        |
| **Reason for touching the face**               |           |            |
| Used to it                                     | 103       | 24         |
| Clean sweat                                    | 178       | 41         |
| Clean nose/eyes                                | 93        | 21         |
| Others                                         | 62        | 14         |
| **Total**                                      | 436       | 100        |
3.6 Intents to comply with proposed covid-19 vaccine

As shown in Table 6, almost three quarter of the respondents 322(74%) said they will not accept vaccine for the disease when provided meanwhile, few 114(26%) will accept will accept it. Amongst this group, most of them 55(48%) will prefer to take the vaccine in liquid form than other forms. However, large proportions of the respondents 151(35%) strongly agreed they can accept vaccine if it is given free of charge. Also, a large proportions of them 352(81%) strongly agreed they will only accept it if they are sure of its safety. Equally, most of them 299(67%) strongly disagreed they will be willing to participate in covid-19 vaccine trial. Prominent among the reasons for not taking the vaccine was that there is hidden agenda behind it which is not to the advantage of humanity. According to majority of the respondents 52(46%), major influencer of accepting the vaccine was friends (fig 5) while the major reason for accepting it was to prevent them from getting the covid-19 disease 88 (77%) (fig 6).

Table 6: Intent to comply with the proposed covid-19 vaccine
| Variables                                                                 | Frequency | Percentage |
|--------------------------------------------------------------------------|-----------|------------|
| **Will accept COVID-19 vaccine when available**                          |           |            |
| Yes                                                                      | 114       | 26         |
| No                                                                       | 322       | 74         |
| **Total**                                                                | **436**   | **100**    |
| **The form COVID-19 vaccine preferred**                                  |           |            |
| Liquid (taken orally)                                                    | 55        | 48         |
| Capsule/Tablet (taken orally)                                            | 26        | 23         |
| Injection                                                                | 23        | 20         |
| Any form                                                                 | 10        | 9          |
| **Total**                                                                | **114**   | **100**    |
| **COVID-19 vaccine can be accepted if it is given free of charge**      |           |            |
| Strongly Agree                                                           | 151       | 35         |
| Agree                                                                    | 104       | 24         |
| Uncertain                                                                | 112       | 26         |
| Disagree                                                                 | 55        | 13         |
| Strongly Disagree                                                        | 14        | 3          |
| **Total**                                                                | **436**   | **100**    |
| **Will accept the COVID-19 vaccine only if I am sure of its safety**    |           |            |
| Strongly Agree                                                           | 352       | 81         |
| Agree                                                                    | 59        | 14         |
| Uncertain                                                                | 14        | 3          |
| Disagree                                                                 | 7         | 2          |
| Strongly Disagree                                                        | 4         | 1          |
| **Total**                                                                | **436**   | **100**    |
| **Will be willing to participate in COVID-19 vaccine trial**             |           |            |
| Strongly Agree                                                           | 2         | 0          |
| Agree                                                                    | 8         | 2          |
| Uncertain                                                                | 22        | 5          |
| Disagree                                                                 | 105       | 24         |
| Reason(s) for not taking COVID-19 vaccine | Strongly Disagree | 69 |
|-----------------------------------------|------------------|----|
| Total                                   | 436              | 100|
| It is not a genuine vaccine             | 41               | 13 |
| Doubt about the sincerity of the advocates of the vaccine | 38 | 12 |
| There is nothing like COVID-19          | 3                | 1  |
| It can be treated easily with local remedies and there is no need for vaccine | 9 | 3 |
| It is in line with anti-Christ agenda   | 41               | 13 |
| There is a hidden agenda behind it which is not to the advantage of humanity | 87 | 27 |
| Bill Gates and his cohort wants to rule the world with it through the concept of Artificial Intelligence | 36 | 11 |
| The essence of the vaccine is to depopulate the world | 67 | 21 |
| Total                                   | 322              | 100|

3.7 Influence of demographic variables on compliance to covid-19 preventive measures

Depicted in Table 7 are the results of the association between demographic variables and compliance to covid-19 preventive measures where all the demographic variables apart from religion had significant (p<0.05) influence on level of compliance. Low 57 (29%), moderate 58(31%) and high(27%) level of preventive measures were kept by respondents who were within the age brackets of 42-51, 32-41 and 52-61 years respectively. As regards gender, low 93(47%) and moderate 96(51%) level of compliance was kept by male respondents whereas their female counterparts kept high 33(63%) level. Equally, low 93 (47%) and moderate 90(48%) compliance level was kept by those that were single whereas high 28(54%) level was mostly maintained by those who were married. Low 117(59%), moderate 80(43%) and high 19(37%) level of compliance were found among the respondents with no child. Also, respondents with secondary school level of education kept low 136(69%) and moderate 132(71%) level while those that attended tertiary level of education were mostly observing high 34(65%) level of compliance. Those who are public servants maintained high level 13(25%) compared to other categories of occupation. Results of Table 7 also showed that Christians were most likely to observe all categories of compliance.

Table 7: Influence of demographic characteristics on compliance to covid-19 preventive measures
| Age (years)        | Low   | Moderate | High  | Total | $\chi^2$ | p-value |
|-------------------|-------|----------|-------|-------|----------|---------|
| 12 – 21           | 27(14%) | 24(13%) | 2(4%) | 53    |          |         |
| 22 – 31           | 26(13%) | 26(14%) | 4(8%) | 56    |          |         |
| 32 – 41           | 41(21%) | 58(31%) | 8(15%)| 107   |          |         |
| 42 – 51           | 57(29%) | 30(16%) | 10(19%)| 97    |          |         |
| 52 – 61           | 38(19%) | 21(11%) | 14(27%)| 73    |          |         |
| 62 – 71           | 4(2%) | 21(11%) | 8(15%) | 33    |          |         |
| 72 and above      | 4(2%) | 7(4%) | 6(12%) | 17    |          |         |
| Total             | 197(100%) | 187(100%) | 52(100%)| 436   | 50.59    | < 0.001 |

| Gender            | Low   | Moderate | High  | Total | $\chi^2$ | p-value |
|-------------------|-------|----------|-------|-------|----------|---------|
| Male              | 166(84%) | 96(51%) | 19(37%)| 281   |          |         |
| Female            | 31(16%) | 91(49%) | 33(63%)| 155   |          |         |
| Total             | 197(100%) | 187(100%) | 52(100%)| 436   | 65.47    | < 0.001 |

| Marital status    | Low   | Moderate | High  | Total | $\chi^2$ | p-value |
|-------------------|-------|----------|-------|-------|----------|---------|
| Single            | 93(47%) | 90(48%) | 12(23%)| 195   |          |         |
| Married           | 91(46%) | 50(27%) | 28(54%)| 169   |          |         |
| Separated/ Divorced | 0(0%) | 16(9%) | 4(8%) | 20    |          |         |
| Co-habiting       | 13(7%) | 31(17%) | 8(15%) | 52    |          |         |
| Total             | 197(100%) | 187(100%) | 52(100%)| 436   | 44.19    | < 0.001 |

| Number of alive children | Low   | Moderate | High  | Total | $\chi^2$ | p-value |
|--------------------------|-------|----------|-------|-------|----------|---------|
| None                     | 117(59%) | 80(43%) | 19(37%)| 216   |          |         |
| 1 – 2                     | 21(11%) | 52(28%) | 12(23%)| 85    |          |         |
| 3 – 4                     | 29(15%) | 38(20%) | 14(27%)| 81    |          |         |
| 5 – 6                     | 19(10%) | 10(5%) | 5(10%) | 34    |          |         |
| 7 and above               | 11(6%) | 7(4%) | 2(4%) | 20    |          |         |
| Total                     | 197(100%) | 187(100%) | 52(100%)| 436   | 29.35    | < 0.001 |

| Highest educational level | Low   | Moderate | High  | Total | $\chi^2$ | p-value |
|---------------------------|-------|----------|-------|-------|----------|---------|
|                           |       |          |       |       |          |         |
3.8 influence of demographic variables on intent to accept covid-19 vaccine

As shown in Table 8, all the socio-demographic characteristics had (p<0.05) influence on the respondents’ intent to accept covid-19 vaccine. Results showed that the acceptance of vaccine is higher among the participants within the age bracket of 52-61 years 28(25%) compared to other age brackets. Also, the female respondents 94(82%) were more likely to take the vaccine than their male counterparts 20(18%). Equally, the married respondents 51(45%) are more likely to accept the vaccine than the singles 36(32%), co-habiting 22(19%) and separated/divorced 5(4%). It was further showed that acceptance of vaccine is higher among the
participants that have secondary school education as their highest level of education 57(50%). In addition, intent to accept vaccine was higher among small and medium scale traders 30(26%) compared to other categories of occupation. As regards religion, participants who were Christians 99(87%) were more likely to accept covid-19 vaccine than other religions.

Table 8: Influence of demographic characteristics on intent to accept covid-19 vaccine
|                          | Intent to accept covid-19 vaccine when provided |
|--------------------------|-----------------------------------------------|
|                          | Yes      | No     | Total | $\chi^2$ | p-value |
| **Age (years)**          |          |        |       |          |         |
| 12 – 21                  | 4(4%)    | 49(15%)| 53    |          |         |
| 22 – 31                  | 8(7%)    | 48(15%)| 56    |          |         |
| 32 – 41                  | 20(18%)  | 87(27%)| 107   |          |         |
| 42 – 51                  | 22(19%)  | 75(23%)| 97    |          |         |
| 52 – 61                  | 28(25%)  | 45(14%)| 73    |          |         |
| 62 – 71                  | 18(16%)  | 15(5%) | 33    |          |         |
| 72 and above             | 14(12%)  | 3(1%)  | 17    |          |         |
| **Total**                | 114(100%)| 322(100%)| 436   | 64.49    | < 0.001 |
| **Gender**               |          |        |       |          |         |
| Male                     | 20(18%)  | 187(81%)| 281   |          |         |
| Female                   | 94(82%)  | 105(18%)| 155   |          |         |
| **Total**                | 114(100%)| 322(100%)| 436   | 21.84    | < 0.001 |
| **Marital status**       |          |        |       |          |         |
| Single                   | 36(32%)  | 159(49%)| 195   |          |         |
| Married                  | 51(45%)  | 118(37%)| 169   |          |         |
| Separated/ Divorced      | 5(4%)    | 15(5%) | 20    |          |         |
| Co-habiting              | 22(19%)  | 30(9%) | 52    |          |         |
| **Total**                | 114(100%)| 322(100%)| 436   | 14.43    | 0.002   |
| **Number of alive children** |      |        |       |          |         |
| None                     | 56(49%)  | 160(50%)| 216   |          |         |
| 1 – 2                    | 33(29%)  | 52(16%) | 85    |          |         |
| 3 – 4                    | 17(15%)  | 64(20%) | 81    |          |         |
| 5 – 6                    | 5(4%)    | 29(9%) | 34    |          |         |
| 7 and above              | 3(3%)    | 17(5%) | 20    |          |         |
| **Total**                | 114(100%)| 322(100%)| 436   | 11.79    | 0.019   |
| **Highest educational level** |      |        |       |          |         |
| Primary level            | 8(7%)    | 48(15%) | 56    |          |         |
| Occupation                          | None     | Student  | Public/Civil Servant | Artisan  | Trading/Small and Medium Enterprise | Farmer  | Company executive | Others  | Total     |
|------------------------------------|----------|----------|----------------------|----------|------------------------------------|---------|-----------------|---------|-----------|
|                                    | 9(8%)    | 23(20%)  | 23(20%)              | 12(11%)  | 30(26%)                            | 6(5%)   | 1(1%)           | 10(9%)  | 114(100%) |
|                                    | 89(28%)  | 69(21%)  | 4(1%)                | 50(16%)  | 61(19%)                            | 20(6%)  | 0(0%)           | 29(9%)  | 322(100%) |
|                                    | 98       | 92       | 27                   | 62       | 91                                 | 26      | 1               | 39      | 436       |
| **Total**                          | **114(100%)** | **322(100%)** | **436**               | **70.03** | **< 0.001**                       | **12.5** | **= 0.029**     | **Total** | **436**    |

| Religion                           | Christianity | Islam | African Traditional Religion | Free thinkers | Atheist | Others  | Total     |
|------------------------------------|--------------|-------|-------------------------------|---------------|---------|---------|-----------|
|                                    | 99(87%)      | 8(7%) | 2(2%)                         | 0(0%)         | 0(0%)  | 5(4%)   | 114(100%) |
|                                    | 300(93%)     | 4(1%) | 8(2%)                         | 0(0%)         | 2(1%)  | 8(2%)   | 322(100%) |
|                                    | 399          | 12     | 10                             | 0             | 2       | 13      | 436       |
|                                    | **Total**    | **436** | **12.5**                        | **= 0.029**  | **Total** | **436**    | **12.5**    | **= 0.029** |

**4.0 Discussion**

Coronavirus disease 2019 (COVID-19) is a challenge to public health and has had vital effect on all aspects of life. This study investigated compliance with covid-19 non-medicinal preventive protocol and intent to accept covid-19 vaccine among adults in Owerri West, Imo state Nigeria. The respondents used for this study were mostly male adults within the age bracket of 32-41 years. They were mainly singles with no child. A reasonable number of them had secondary school as their highest level of education and most of them were unemployed. Equally, almost all of them were Christian.

The findings of this study showed that the participants had a good understanding of the sources of COVID-19 infection and its transmission routes. Results showed that almost all of them 433(99%) have heard about
covid-19 especially from radio 151(35%) than other source of information. This was similar to the study by
(23) in Jazan and Aseer regions of South-West Saudi Arabia where majority of the respondents 987 (98.7%)
have heard of COVID 19. The use of social media (55.7%) and TV (27.5%) constitute the major sources of
information about COVID-19 in the study of (24) in North-Central Nigeria. Contrarily, (25) in their study in
Nigeria found that majority of the respondents (80.1%) got their information of COVID-19 from social media.
In addition, Knowledge about coronavirus disease has been through numerous avenues with various social
media platforms as well as internet dominating as the main sources of information about this disease
(26,27,28). Nevertheless, social media often carry misinformation and anti-vaccination sentiments, like
heightened side effects, machination theories, and poor efficacy that may expand vaccine hesitancy (29).

A vast number of them 423(98%) know that the disease was first reported in 2019 in China and they also
know the cause of the disease 397(92%). According to (30), COVID 19 disease is a recent infectious disease
emanating from Wuhan China and is caused by the CoV. As regards the route of covid-19 transmission, many
of them were aware that the disease is transmitted through respiratory droplet and it can enter the body
through the nose, mouth and eyes. Moreover, almost all of them know that the disease has no cure 398(92%).
Similarly, (30) reported that the spread of this disease can through small droplets from the mouth or nose of
the patient during sneezing or coughing. On falling on surrounding objects and someone else touching this
objects contaminated with the droplet, then that person touches the mouth, nose or eyes (facial triangle), then
the person can be infected with the disease. (31) in their study reported that more than 80% of participants
knew COVID 19 to be transmitted by person to person, handshake and contact with infectious droplets only.

In terms of the perception of the respondents about covid-19, majority of them strongly agreed that the
disease is real and is a serious disease but not in Nigeria where most of the participants strongly disagreed
that people did not die from the disease, know or have seen someone who suffered from the since the disease
can be prevented through regular washing of hands with soap, maintaining social distance, wearing of nose
mask, cleaning and disinfecting the environment. (32) in their study found that 4/5 of the respondents
perceived there are confirmed cases of the disease in Nigeria and other parts the world.

Understanding the people's perception of risk is important in ensuring adequate health protection practices
during virus upsurge (33).

Moreover, covid-19 prevention guidelines was provided by WHO and these included washing hands with
detergent under running tap, cough protocol, use of alcohol-based hand sanitizers, maintaining 1m – 1.5m
social distancing, restrain from social gatherings and wearing of the N95 mask (for medical professionals)
among others [34,35], to reduce the infection spread.

Preventive practices taken by the participants, it was found that most of them never used disposable nose
mask only once before discarding them. However, most of them sometimes wear nose mask when going out
of the house, wash their hands with soap up to 20 seconds and maintain at least one meter distance when
with others. Also, the participants sometimes wash cloth nose mask before reuse but never share nose mask
with any other person. Public mask wearing according to (3,36) is effectual in stopping the spread of COVID
19 when worn appropriately with high compliance especially when combined with other preventive measures
like hand hygiene. Moreover, most of the respondents sometimes touch face with fingers, clean and disinfect
door handles, tables and chairs. It was also found that when sneezing/coughing, most of them sometimes do that into their elbow and dispose tissue paper used for sneezing/coughing into a closed bin. It was further showed that sometimes a large number of the respondents travel in a crowded vehicle, attend events with more than 50 persons in attendance and in general sometimes follow all the recommended preventive measures resulting larger proportions of them 197(45%) observing low level of compliance. In the study of (35) 698 (53.7%), participants showed high compliance to recommendations, suggesting that interventions like continued strict implementation of isolation policies, psychological counseling as well as health education should be inculcated, as these may improve compliance (35).

Globally, preventative procedures enacted by national, state, and local governments is now affecting normal routines of many people, and this rules include social distancing and restriction of movement within and outside the countries (37;38). These adjustments are necessary to combat the disease and protect health systems (39). Previous study has shown that the present most appropriate and efficient public health interventions can only be achieved when they are duly accepted by the public (40). However, preliminary findings showed so many variations in people's eagerness to implement measures that can mitigate pathogen transmission (41;42). Findings from this research also revealed that the major barrier for not observing the preventive measures was that majority of the respondents could not wash their hands with soap for up to 20 minutes due to lack of time, they feel uncomfortable with wearing of nose mask, they attend crowded events because it is crucial and they usually touch their face in the process of cleaning sweat. (43) reported that some measures like wearing of face mask are seen as causing social discomfort, that can be stressful but at the same time if not worn will expose one high risk of the infection. Similarly, when the participants in the study of (44) were asked their reason for their unwillingness to undertake preventive standards, almost 2/5 of them reported that the condition does not apply to them, and more than one-quarter were of the opinion that the measures demands so much effort (time, cost, etc.) and others were likely not to adhere to these measures.

On the intent to comply with the proposed covid-19 vaccine, only few of the participants 114(26%) were willing to accept it especially if it given free of charge and its safety trusted and this decision to accept the vaccine was prominently influenced by friends. This figure is similar to 29.0% acceptance recorded by (24). However, most of them were not willing to participate in vaccine trial 299(69%). Out of this group 114(26%) that will accept the vaccine, almost half of them 55(48%) will prefer it in liquid form than any other forms. As noted by majority of the respondents 87(27%) main reason for not taking vaccine was there is a hidden agenda behind it which is not to the advantage of humanity while major reason for accepting it was to prevent the recipient from getting the disease. This finding suggests that the most attitudinal and behavioural drawback to accepting a coronavirus overall mistrust in the benefits and safety of the vaccines and worry about their unforeseen consequences. This supports some previous findings indicating that concerns about the vaccines originality and safety are key drawbacks to vaccine willingness (45; 46; 47). Other prominent attitudinal and behavioural drawbacks are poor compliance with government guidelines on coronavirus (45;46;48) and poor knowledge of the disease, which has also been indicated in other works (49; 48).

It was also revealed that all the demographic variables had strong influence (p<0.05) on the level of compliance to covid-19 preventive measures exception being religion (p=0.130). This disagrees with the finding of (50) who reported obvious relationship of religion and compliance with the government guidelines.
Highest level of compliance was maintained by the female respondents who were within the age bracket of 52-61 years. This is in agreement with the findings of (51) in which females in Saudi public were more likely to keep preventive and precautionary standards than males (53.6% versus 40.6%, respectively) and with the findings of (52) in which female students from Egypt were 3.6 times more likely to avoid crowded places than male students. Age has been reported to have strong association with compliance, such that younger adults less likely to adhere.

Equally, highest level of compliance was mostly kept by those who are married with no child. Being married has also been reported have strong relationship with higher rates of compliance with quarantine measures during avian influenza outbreak (54). Level of education also had strong influence on level of compliance such that those who had tertiary education were most likely to keep high compliance compared to other levels of education. Other workers (55; 56) have shown that higher education level correlates with higher knowledge of coronavirus, which is in line with the present results. This suggests that higher level of knowledge of COVID-19, especially precautionary and control standards and prognoses, results to better behavioural compliance and a higher response to coronavirus prevention and control standards. Higher level of compliance was also maintained by the participants who are public/civil servants with significant association (p<0.05). This is in line with the finding of (57) who reported close association of the participants’ occupations with preventive compliance, with professional and technical personnel, office and management personnel having better scores compared to outdoor workers.

Furthermore, all the demographic variables had significant association with the respondents’ intent to accept covid-19 vaccine when provided. Acceptance was higher among female respondents within the age group of 52-61 years. Also, acceptance was higher among married respondents who had 1-2 children and who had secondary school as their highest level of education. Higher level of vaccine acceptance was also shown in participants who are small/medium traders and who are Christians with significant association (p<0.05). Socio-demographic attributes were also shown to be strong predictors of pandemic vaccine acceptability in UK, France, Australia, US, and Japan (46; 58; 59). Only age and marital status were recorded as substantial factors in predicting the acceptability of coronavirus vaccines in Saudi Arabia (60).

5.0 Conclusions

Findings of this research showed that almost all the participants have heard about covid-19 from radio and they have good knowledge of the disease in terms of the cause, routes of transmission and seriousness of the disease in other parts of the world other than Nigeria since most of them did not know or have seen anyone who neither suffered nor died from the disease. Most of them believed the disease can be prevented through regular washing of hands with soap, maintaining social distance, wearing of nose mask, cleaning and disinfecting the environment. Nevertheless, it was found that the participants follow all the recommended preventive measures sometimes, resulting in larger proportions of them observing low level of compliance. Major barrier for not observing the preventive measures was that they believed that hand washing with soap for up to 20 minutes is not necessary, they feel uncomfortable with wearing of nose mask, they attend crowded events because it is crucial and they usually touch their face in the process of cleaning sweat. Only a few of them were willing to accept covid-19 vaccine especially if it given free of charge, its safety trusted and it's in liquid form. Major reason for not taking vaccine was there is a hidden agenda behind it which is not to
the advantage of humanity while major reason for accepting it was to prevent the recipient from getting the
disease. With the exception of religion, all the demographic characteristics had significant influence on the
level of compliance to covid-19 preventive measures. Moreover, all the demographic variables had significant
association with the respondents’ intent to accept covid-19 vaccine when provided. Finally, to motivate people
to receive the vaccines, scientific evidence on the vaccine efficacy, safety, and side effects must be made
available to the public.

Declarations

Competing interests

The authors declare that they have no competing interests.

Author's contribution

SNOI and UWD conceived the study, contributed in drafting the study and designed the questionnaire, CRN,
CJN, UMC, OUG and INSD: Study design, synthesized the analysis and revisited the manuscript and critically
evaluated the intellectual contents collection, NDO and CDI and participated in data collection and performed
the statistical analysis. All authors read and signed the final version of paper

Ethical considerations

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by
the authors.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on
request.

Consent for publication

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## Figures

|                |     |     |       |      |     |     |
|----------------|-----|-----|-------|------|-----|-----|
| Christianity   | 399 | 12  | 10    | 0    | 2   | 13  |
| Islam          |     |     |       |      |     |     |
| African        |     |     |       |      |     |     |
| Traditional    |     |     |       |      |     |     |
| Religion       |     |     |       |      |     |     |
| Free thinkers  |     |     |       |      |     |     |
| Atheist        |     |     |       |      |     |     |
| Others         |     |     |       |      |     |     |

**Figure 1**

Religion of the respondents
Figure 2
Transmission route of COVID-19
Figure 3
Awareness and Source of Information on Covid 19

Figure 4
Level of compliance to preventive measures
Figure 5

Major influencer of accepting COVID-19 vaccine

- Prevent me from getting COVID-19
- Don’t want to be infected with COVID-19
- COVID-19 kills people and I don’t want to die

88 (77%)
Figure 6

Reason for accepting the vaccine