COVID-19 pandemic: Nigerians’ knowledge, perception and adherence to preventive measures

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Abstract

Aims: One of the ways to manage the current coronavirus disease 2019 (COVID-19) pandemic is monitoring of public knowledge, risk perceptions, adherence to preventive measures and preparedness behaviors. This is of utmost importance in resource limited countries. This study determined the knowledge and perception about COVID-19; adherence to COVID-19 preventive measures; as well as predictors of self-perceived risk of contracting COVID-19 among Nigerian adults.

Methods: A cross-sectional study was conducted among Nigerian adults ≥ 18 years using an online survey. Participants were recruited using the authors’ social networks. Data was analysed using descriptive and inferential statistics at 5% level of statistical significance.

Results: Generally, a high proportion of respondents had correct knowledge about COVID-19. However, only about half (49.8% and 49.9%) had correct knowledge that obesity was a risk factor for COVID-19 and that antibiotics cannot be used to treat COVID-19. Most (84.1%) did not have a self-perceived risk of contracting COVID-19. Most (81.0%) have been avoiding crowded places and 61.3% washed their hands very often. Predictors of self-perceived risk of COVID-19 were age 40-59 years (OR 2.05, CI 1.217-3.435), ≥ 60 years (OR 4.68, CI 1.888-11.583) and visiting crowded places (OR 2.27, CI 1.499-3.448).

Conclusion: Our study recommends more rigorous public health education aimed at improving COVID-19 outbreak response in Nigerian. Also, physical and social distancing should be emphasized across all age groups with additional focus on the older population.

Introduction

Coronavirus disease 2019 (COVID-19) has been a major public health concern since December 2019 when it was first detected in Wuhan, China. The causal virus called the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is highly infectious and has recorded more than 3 million cases within a space of four months of outbreak. As at May, 2020, two hundred and twelve (212) countries of the world [1] have been affected by the highly infectious SARS-CoV-2 and it still has a high chance of reaching many new territories. The global mortality rate was pegged at about 3.4% in early March, 2020 [2], but a shift from this is expected to occur before the end of the pandemic.

The understanding of the transmission risk is inconclusive, however, the popular seafood market in Wuhan was initially linked to the outbreak [3]. Man-to-man transmission is now the main route of transmission. The fatal episode of the disease presents pneumonia-like symptoms similar to severe acute respiratory syndrome coronavirus (SARS-CoV), and Middle East respiratory syndrome coronavirus (MERS-CoV) [4]. Other common symptoms include high fever, dry cough, fatigue, malaise, and difficulty in breathing [5]. Diarrhoea was recently included due to its high occurrence in many positive cases in Africa.

Coronavirus disease 2019 has become a major issue in Nigeria as cases have been confirmed in 34 states of the country including the Federal Capital Territory (FCT) as at May, 2020. From an
epidemiological point of view, the observed trend in incidence of newly confirmed cases in Nigeria suggests that it may take a while before the country is able to flatten the COVID-19 incidence curve. Due to lack of vaccine or proven drugs for the management of COVID-19, transmission control becomes a very important intervention that can abate the spread of the disease in community and health care settings [6]. This is even more important in a country that is deficient in good public health care system. Despite the efforts put in place by the Nigerian government to mitigate the impact of COVID-19, poor public knowledge, attitudes and practices of people relative to COVID-19 control can foil even the best national public health control response.

Nigeria is currently in the heat of COVID-19 pandemic and to guarantee a successful early containment of the disease, in the absence of vaccine, adherence to control measures determined by people's knowledge, attitudes, and practices towards COVID-19 is very important [7]. The aim of this study therefore was to determine the knowledge and perception about COVID-19 among Nigerian adults during a period Nigeria is seeing a consistent increase in the number of new cases. This study also assessed adherence of Nigerian adults to the current COVID-19 preventive measure guidelines in Nigeria. Lastly, this study determined the predictors of self-perceived risk of contracting COVID-19 among the study participants. Findings from this study would provide useful information for public health policy development and implementation for quick response to COVID-19 outbreak in Nigeria.

Materials And Methods

Study area

The study was carried out in Nigeria, the most populated country in Africa. The country's population is estimated to be about 206 million [8]. Nigeria is located on latitude 10° North and longitude 8° East and has a total area of 923,768 square kilometer.

Coronavirus disease 2019 was first confirmed in Nigeria on 27 February 2020 in Lagos State. The index case was an Italian who travelled from Italy to Nigeria [9]. On 9 March 2020, a Nigerian who had contact with the Italian was confirmed the second person infected with SARS-CoV-2. Nigeria ranks 6th in the total number of active coronavirus disease 2019 cases in Africa as at May, 2020. As at the time of this report, there were 4399 confirmed cases, from which 778 and 143 have recovered and died respectively.

To curtail the spread of the SARS-CoV-2 in Nigeria, two states namely Lagos, Ogun and the Federal capital territory were under total lock down as the time this study was conducted. Other states were under partial lock down during the study period.

Study design and sample size

This cross-sectional study was conducted from March 31 to April 25, 2020. To avoid physical contact with our participants, a convenience sampling method was utilized to recruit study participants. We used authors’ social media networks and emails to source for information via an online-based survey. Only
adults (age 18 years and above) were recruited for the study. Nigerians in diaspora, foreigners living in Nigeria, and medical practitioners were excluded from the study. Coronavirus disease 2019 transmission is still on-going, so, we had no prevalence data that could be used for the estimation of the sample size. Therefore, the minimum sample was calculated based on the country’s estimated 100 million adults population in 2020 [8], 4% precision and at 95% confidence level using an online-based sample size estimator [10]. Although a sample size of 601 participants was computed, all those who volunteered to participate in the study were included. Overall we recruited 1258 participants for our study but only 1022 had data that were fit for analysis.

Data collection

Data was collected using a structured questionnaire adapted from the National Health Commission of the People’s Republic of China protocols and guidelines on COVID-19 [11,12]. The questionnaire comprised four sections namely; socio-demographics, knowledge about COVID-19, perceptions about COVID-19 and adherence to preventive measures.

Section one of the questionnaire comprised 10 questions on socio-demographic characteristics of the participants. Information like age, gender, education level, religion and marital status were obtained in this section. In section two, 26 questions related to knowledge about transmission, risk factors, symptoms, disease progression, treatment and prevention of COVID-19 were asked from the participants. The third section had questions related to perception of the respondents about COVID-19. The final section contained 12 questions on adherence to preventive measures against COVID-19.

Ethical approval

The study protocol was approved by the Ethics Committee of the University of Medical Sciences/Teaching Hospital, Ondo City, Ondo State, Nigeria. Careful explanation of the purpose, content, and implication of the research was made known to the participants. Confidentiality of the information provided was assured.

Statistical analysis

Data generated were checked for accuracy and coded. Subsequently, the data were then exported to SPSS version 24 (SPSS, Chicago, IL) for statistical analysis. Descriptive statistics like frequency counts, percentage and mean were used to present responses emanated from survey. Chi-square test was used to determine bivariate associations between the dependent variable and selected socio-demographic features like age, gender, marital status and occupation of respondents; knowledge; perception; and preventive measures on COVID-19. Logistic regression analysis was used to determine the predictors of likelihood of contracting COVID-19 among subjects recruited for the study. Variables on socio-demographic characteristics, knowledge, perception and preventive measures on COVID-19 were included in the model. The statistical level of significance was set at $P < 0.05$. 
Results

The mean age of the participants was 33.4 ± 11.8 years, 53.5% were males and 52.2% were not married. Majority of the participants had education up to the tertiary level (88.5%) and about two-fifth (40.3%) were civil servants (Table 1).

Most (94.1% and 91.4% respectively) of the respondents have encountered information about the mode of transmission and prevention of COVID-19. The internet was the most (97.0%) frequent reported source of information about the disease by the participants (Table 2).

Correct knowledge about the mode of transmission, risk factors, symptoms, disease progression, treatment and prevention of COVID-19 was generally high among the study participants. Although most (97.7%) knew that COVID-19 spreads via respiratory droplets of infected individuals when they sneeze or cough, two hundred and ninety-nine (29.3%) did know that transmission of COVID-19 without fever or other symptoms was possible. Although a high proportion (80.4%) correctly reported that chronic diseases was a risk factor for severe COVID-19, only 49.8% knew that obesity was a risk factor for severe COVID-19. Although a higher proportion of the respondents correctly knew that cough (95.3%) and fever (89.3%) were symptoms of COVID-19, only a few correctly knew that fatigue (47.4%) and muscle pain (30.9%) were also symptoms of COVID-19. Less than half (46.0%) correctly knew that persons infected with COVID-19 have lesser frequency in occurrence of common cold-associated symptoms like, stuffy nose, runny nose, and sneezing. Quite a number (86.3%) of the respondents knew that not all persons infected with COVID-19 progressed to the severe form of the disease and 70.5% knew that most people infected with COVID-19 will not die of the disease. Even though almost all the participants (94.7%) correctly reported that there was currently no effective cure but early management of COVID-19 could aid recovery, 50.1% still wrongly stated that antibiotics can be used to treat COVID-19. More than 90% of the participants knew that avoidance of crowded places, staying at home during transmission and regular washing of hands with soap and running tap could prevent COVID-19 transmission (Table 3).

A total of 98.5% agreed that the outbreak of COVID-19 in Nigeria was real while about a tenth (8.4%) perceived it as a disease of the rich people. Although a little above half (54.1%) of the respondents perceived that the government of Nigeria is not handling COVID-19 outbreak well, most (95.8%) still believed the government will win the battle against COVID-19 outbreak in Nigeria (Table 4).

Only a few 15.9% believed they were at risk of contracting COVID-19. The commonly adduced reasons for not been at risk of contracting COVID-19 among those who did not perceive themselves to be at risk of contracting COVID-19 were they always avoided crowded places (69.1%) and they always washed their hands with soap under running tap (67.1%) (Table 5). The study showed that 19% of the respondents had visited crowded places in the recent times, 38.7% did not wash their hands with soap and running water very often, 37% rarely or never used hand sanitizers and 64% do not wear face masks. Majority (87.5%) of the respondents complied with the ‘stay at home’ government’s policy to arrest the spread of COVID-19 (Table 6).
Factors significantly associated with self-perceived risk of contracting COVID-19 were age, gender, marital status, occupation, frequency of hearing about COVID-19, visitation to crowded places, use of hand sanitizers, compliance with stay at home instruction from the government and history of self-treatment with preventive drugs against COVID-19 (P<0.05) (Table 7).

Predictors of self-perceived risk of contracting COVID-19 in this study were age, gender, marital status and visitation to crowded places in recent times. Respondents who were aged 40-59 years were two times more likely to perceive themselves as having a risk to contract COVID-19 (OR 2.05, CI 1.217-3.435), while those who were 60 years and above were about five times more likely to perceive themselves as having a risk to contract the disease (OR 4.68, CI 1.888-11.583) compared to respondents aged 18-39 years. Female respondents were 0.5 times less likely to perceive themselves as having a risk to contract COVID-19 (OR 0.51, CI 0.352-0.751) when compared to male respondents. Respondents who were married were 0.5 times less likely to perceive themselves as having a risk to contract COVID-19 (OR 0.53, CI 0.321-0.888) compared to those who were not married. Visitation to crowded places was three times more likely to predict self-perceived risk of contracting COVID-19 (OR 2.27, CI 1.499-3.448) compared to not visiting crowded places (Table 7).

**Discussion**

To the best of our knowledge, this is the first comprehensive report in Nigeria that considered the knowledge about the spread, symptoms, disease progression, risk factors, treatment and preventive measures against COVID-19. In addition, our study assessed perceptions about COVID-19 and adherence to preventive measures among the Nigerian population. We also determined the predictors of self-perceived risk of contracting COVID-19.

A common source of information about COVID-19 in this study was the internet. This is similar to what was reported in a recent study from Egypt which also identified internet as the most common source of information about COVID-19 [5]. Coronavirus disease 2019 information from the Ministry of Health channeled through television and radio stations are often regulated and are always in line with the World Health Organization (WHO) and Nigeria Centre for Disease Control (NCDC) guidelines. To reach more people, bulk sms and online outlets through the use of social media like Facebook, twitter and so on are now also widely adopted by the Ministry of Health and NCDC, in addition to television and radio, to disseminate COVID-19-related information. The use of internet however, has also increased the influx of fake and unauthenticated news. Caution should therefore be exercised in the use of online outlets as the major source of information by individuals. Doubtful online information should be verified from other reliable sources.

The knowledge about the spread, symptoms, disease progression, risk factors, treatment and preventive measures against COVID-19 in this study was generally good. This can be attributable to the high level of education of our respondents as corroborated by a study among educated people in China which also revealed good knowledge about COVID-19 [7]. Despite the general good knowledge displayed in virtually
all the domains of knowledge assessed, the responses to some specific knowledge questions are disturbing and need to be clarified by more public enlightenment. For example, the finding that some respondents either did not know or did not believe that asymptomatic individuals can transmit the virus is quite worrisome. Such persons may be tempted not to adhere to the prevention guidelines for COVID-19 where there are apparently healthy individuals and this can undermine the preventive efforts of COVID-19 transmission from person to person.

Also, quite a number of our study participants clearly misconstrued sneezing as a symptom of COVID-19. Although unprotected sneezing is one of the effective ways of transmitting the novel coronavirus from an infected individual, sneezing is not part of the community case definitions for COVID-19 according to NCDC guideline. More public enlightenment on the community case definitions of COVID-19 is needed to avoid the stigma associated with sneezing in public places which is increasingly becoming high in Nigeria.

Another area where Nigerians need further enlightenment is knowledge about the at-risk population for severe COVID-19. Although knowledge about the risk factors for severe COVID-19 appeared good, approximately 20% of individuals still either did not know or did not believe that severe COVID-19 is associated with chronic illnesses. Similarly, approximately half of our study participants did not know or did not believe there was a relationship between obesity and severity of COVID-19. These findings are disturbing as there are documented evidences that older individuals, people with chronic illnesses and obesity needs to take extra precaution to prevent themselves from contracting COVID-19 as they are more at risk of progressing to the severe form of the disease [13,14]. There is therefore a need for serious public enlightenment if the desired reduction in morbidity and mortality associated with COVID-19 in this population is to be attained. Another call for concern is the reasonable number of respondents who believed that antibiotics can be used for managing COVID-19 and those who did not know that antibiotics cannot be used for managing COVID-19. These two groups of individuals could become victims of inappropriate use of antibiotics and its subsequent complications as the sale of drugs is generally unregulated in Nigeria with many medicine stores not requesting for doctors’ prescriptions before drugs are sold to patients. Another implication of the inappropriate use of antibiotics, especially in Nigeria, where the use of antibiotics has been grossly abused, is that it poses serious public health threat in relation to antimicrobial resistance. Stressing the fact that the World Health Organization disapproves the use of antibiotics for the treatment of COVID-19 can therefore not be overemphasized [15].

Coronavirus disease 2019 infection in Nigeria started among international travelers, many political office holders and elites at the early stage. This made a number of people to believe that it was a disease of the rich from anecdotal evidence. Currently however, COVID-19 transmission is in the community transmission phase in Nigeria where everybody is now at risk of contracting the disease. The fact that some few individuals in our study still believed that COVID-19 is a disease of the rich is therefore disheartening and disturbing. These set of individuals are not likely to adhere to the COVID-19 prevention guidelines and may jeopardize the current efforts in the fight against this highly contagious disease. Hence, more public education is needed if the fight against COVID-19 is to be won.
Findings from this study revealed that our study participants are quite optimistic that the Nigerian government can win the current battle against COVID-19. Study participants from a recent study among the Chinese population also had similar optimism [16]. Previous Government outbreak response (Ebola outbreak in Nigeria and Severe Acute Respiratory Syndrome outbreak in China) in these two countries may be a possible reason why the populace are confident that their Government can handle the current COVID-19 outbreak.

In this study, a total lockdown of the nation was perceived as a measure that can help to curtail the current COVID-19 pandemic. This should however be interpreted with caution because most of our respondents are highly educated persons and civil servants who may be on salaries and hence are not representative of the entire population. Anecdotal evidence suggests that a total lockdown may not be appropriate for Nigeria as quite a number of her citizens are not salary earners and therefore have to fend for themselves, especially when the provision of palliatives is not effective. Further studies addressing the perception of the self-employed and those who work with private establishment about the total lockdown policy as well as discussion involving all relevant stakeholders about possible ways to adapt the lock down policy to the Nigerian context is urgently recommended.

The self-perceived risk of contracting SARS-CoV-2 among our study population was high when the proportions are converted to absolute numbers. Among those that perceived themselves as not being at risk of contracting the virus in this study, reasons adduced for their self-perceived risk include the fact that they adhere to some preventive measures such as avoidance of crowded places and regular washing of their hands with soap under running tap. This assertiveness is quite true as these measures are highly effective in breaking the chain of transmission of the disease and they should be highly encouraged.

Some of the good preventive measures adopted, as reported by our participants, included avoidance of crowded places; frequent hand washing with soap and running water; and use of hand sanitizers. Even though our respondents reported adherence to some precautionary measures to prevent the spread of COVID-19, the adherence in our study was low compared to the measures taken in other countries like China and Egypt [5,7]. Reasons why people are not adhering to this preventive measures in Nigeria should be addressed urgently. For example, some of our study participants rarely or do not use hand sanitizers because they cannot afford it, feel it is scarce or feel its use is not necessary. Recommended ways of increasing the adherence to COVID-19 prevention guidelines among the Nigerian population include providing public education on clear explanation on why the adherence to COVID-19 prevention measures needs to be observed, disabusing peoples’ minds about COVID-19 myths, providing facts and correct information about COVID-19, and addressing obstacles hindering the full adherence to the prevention guidelines among other recommendations.

Only a few of our respondents used face mask as at the time data were collected. Majority of the people believed it was not necessary to use face mask. A significant number of the respondents could not also use face mask because of hike in price. There is currently no consensus on the use of face mask by healthy people in public places. However, the Centres for Disease Control and Prevention (CDC) has
recommended the use of face mask in areas where there is significant community-based transmission [16]. The WHO also recommends the use of face masks to population at risk of exposure and the vulnerable groups [17]. In Nigeria, where there is no efficient public health alert system, reliable disinfection programme, and increase in the transmission rates in many major cities, the government and the local public health agencies of the country have made the right decision in making the wearing of face mask compulsory in public places.

The use of vitamins was the most common preventive chemotherapy used by our respondents. Although an earlier study supported the use of vitamins for the management of COVID-19 [19], a more recent review of the evidence on the use of vitamin D for treatment or prevention in COVID-19 rebuffed this [18].

Older adults and those who visited crowded places were more likely to have a self-perceived risk of contracting COVID-19 from our study. These are not surprising results because documented risk factors for transmission of COVID-19 include older age and overcrowding. These results therefore underscores the importance of physical and social distancing across all age groups with additional focus on the older population. Females and married persons were less likely to have a self-perceived risk of contracting COVID-19. Reasons why this was so is not so clear and more research may need to be conducted to determine the reason for this.

One of the limitations of this study was that the uneducated people and those living in rural areas who are likely to be more vulnerable due to poor knowledge and poor preventive measures practices were not represented in this study. It is therefore very important to conduct similar study among the uneducated and rural dwellers in Nigeria. Also, the online nature of the study did not permit us to conduct a focus group discussion and in-depth interview which could have further provided us with more details on the participants’ responses. Despite these limitations, this study was able to add to the existing body of knowledge on COVID-19 in Nigeria.

Currently, COVID-19 is being transmitted actively in Nigeria. To effectively break the chain of transmission of the current outbreak, there is an urgent need for a robust public enlightenment about the disease. Also, physical and social distancing should be emphasized across all age groups with additional focus on the older population.

**Declarations**

**Competing interest**

Authors declare no conflict of interest

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### Tables

Table 1. Sociodemographic characteristics of the respondents

| Variables          | Frequency (N=1022) | Percentage (%) |
|--------------------|--------------------|----------------|
| **Age (years)**    |                    |                |
| 18-39              | 756                | 74.0           |
| 40-59              | 230                | 22.5           |
| ≥ 60               | 36                 | 3.5            |
| **Gender**         |                    |                |
| Male               | 547                | 53.5           |
| Female             | 475                | 46.5           |
| **Marital status** |                    |                |
| Married            | 489                | 47.8           |
| Not married        | 533                | 52.2           |
| **Education**      |                    |                |
| Tertiary           | 904                | 88.5           |
| Senior Secondary   | 112                | 11.0           |
| Primary            | 6                  | 0.6            |
| **Religion**       |                    |                |
| Christianity       | 956                | 93.5           |
| Islam              | 56                 | 5.5            |
| Others             | 10                 | 1.0            |
| **Occupation**     |                    |                |
| Trading            | 101                | 9.9            |
| Civil Servant      | 412                | 40.3           |
| Farming            | 21                 | 2.1            |
| Self-employed      | 6                  | 0.6            |
| Student            | 241                | 23.6           |
| Unemployed         | 79                 | 7.7            |
| Others             | 162                | 15.9           |
Table 2. COVID-19 information which respondents have heard about

| Variables                      | Frequency (N=1022) | Percentage (%) |
|--------------------------------|--------------------|----------------|
| Information domain*            |                    |                |
| Transmission                   | 962                | 94.1           |
| Prevention                     | 934                | 91.4           |
| Management                     | 668                | 65.4           |
| People at risk                 | 774                | 75.7           |
| Others                         | 40                 | 3.9            |
| Frequency of hearing about COVID-19 |                |                |
| Very often                     | 810                | 79.3           |
| Often                          | 158                | 15.5           |
| Sometimes                      | 41                 | 4.0            |
| Never                          | 13                 | 1.3            |
| Sources of information*        |                    |                |
| Internet                       | 991                | 97.0           |
| Radio                          | 545                | 53.3           |
| Television                     | 797                | 78.0           |
| Health centres                 | 205                | 20.1           |
| Friends                        | 593                | 58.0           |
| Community members              | 270                | 26.4           |
| Church                         | 416                | 40.7           |
| Mosque                         | 35                 | 3.4            |
| Others                         | 31                 | 3.0            |

*Multiple response
Others (information domain); conspiracy theories, benefit of good hygienic practices, data and statistics, death rate, economic impacts, genotypic mutation, convalescent plasma therapy, pathophysiology, diagnosis, morphology Others (sources of information); WHO, NCDC, UNICEF, newspaper, place of work, university led webinar, seminar/training, books, family members

Table 3. Knowledge about COVID-19 (N = 1022)
Variables | Correct response | Percentage (%) |
--- | --- | --- |
Eating or contact with wild animals could result in infection with COVID-19 | 312 | 30.5 |
COVID-19 spreads via respiratory droplets of infected individuals when they sneeze or cough | 999 | 97.7 |
No transmission of COVID-19 without fever or other symptoms | 723 | 70.7 |
Money can serve as vehicle of COVID-19 transmission | 839 | 82.1 |
Older people are more likely to have severe COVID-19 | 912 | 89.2 |
Chronic illnesses is associated with severe COVID-19 | 822 | 80.4 |
Non-obese condition is associated with severe COVID-19 | 509 | 49.8 |
Symptoms of COVID-19 | | |
Fever | 913 | 89.3 |
Fatigue | 484 | 47.4 |
Cough | 974 | 95.3 |
Muscle pain | 316 | 30.9 |
Sneezing | 889 | 87.0 |
Persons infected with COVID-19 have lesser frequency in occurrence of common cold-associated symptoms | 470 | 46.0 |
Not all persons with COVID-19 will develop severe cases of the disease | 882 | 86.3 |
Most people infected with the COVID-19 die from it | 720 | 70.5 |
No effective cure for COVID-19 but early management of infection can aid recovery | 968 | 94.7 |
Antibiotics can be used to treat the COVID-19 | 510 | 49.9 |
Wearing of face mask can protect against infection with COVID-19 | 852 | 83.4 |
Children and young adults need not take measures to prevent against COVID-19 because the disease is more severe among old adults | 878 | 85.9 |
Avoidance of crowded places is necessary for COVID-19 prevention | 1004 | 98.2 |
Coronavirus disease can be prevented by avoiding the use of public transportation | 949 | 92.9 |
Coronavirus disease can be prevented by staying at home during transmission period | 1003 | 98.1 |
Coronavirus disease can be prevented by washing of hands regularly with soap and water under running tap | 1007 | 98.5 |
Coronavirus disease can be prevented by covering of mouth and nose while sneezing or coughing | 989 | 96.8 |
Isolation and treatment of people who are infected with COVID-19 are effective ways to reduce the spread of the virus | 1004 | 98.2 |
People who have contact with someone infected with COVID-19 should be isolated immediately in a designated isolation centre | 999 | 97.7 |
The observation period during isolation of people who are infected with COVID-19 is 14 days | 975 | 97.4 |

*Multiple response*

Table 4. Perceptions about COVID-19
| Variables                                                                 | Frequency (N=1022) | Percentage (%) |
|--------------------------------------------------------------------------|---------------------|----------------|
| **COVID-19 outbreak in Nigeria is real**                                 |                     |                |
| Strongly Agree                                                           | 740                 | 72.4           |
| Agree                                                                    | 267                 | 26.1           |
| Disagree                                                                 | 7                   | 0.7            |
| Strongly Disagree                                                        | 8                   | 0.8            |
| **COVID-19 is a disease of the rich people**                             |                     |                |
| Strongly Agree                                                           | 26                  | 2.5            |
| Agree                                                                    | 60                  | 5.9            |
| Disagree                                                                 | 458                 | 44.8           |
| Strongly Disagree                                                        | 478                 | 46.8           |
| **Total lockdown of the nation will help to control the spread of COVID-19** |                     |                |
| Strongly Agree                                                           | 541                 | 52.9           |
| Agree                                                                    | 405                 | 39.6           |
| Disagree                                                                 | 63                  | 6.2            |
| Strongly Disagree                                                        | 13                  | 1.3            |
| **Compliance with preventive measures will curtail the spread of COVID-19 over time** |                     |                |
| Strongly Agree                                                           | 683                 | 66.8           |
| Agree                                                                    | 324                 | 31.7           |
| Disagree                                                                 | 12                  | 1.2            |
| Strongly Disagree                                                        | 3                   | 0.3            |
| **The Nigerian government is handling the problem with the COVID-19 well** |                     |                |
| Strongly Agree                                                           | 72                  | 7.0            |
| Agree                                                                    | 481                 | 47.1           |
| Disagree                                                                 | 352                 | 34.4           |
| Strongly Disagree                                                        | 117                 | 11.4           |
| **I have confidence that Nigeria can win the battle against the COVID-19** |                     |                |
| Strongly Agree                                                           | 569                 | 55.7           |
| Agree                                                                    | 410                 | 40.1           |
| Disagree                                                                 | 35                  | 3.4            |
| Strongly Disagree                                                        | 8                   | 0.8            |
Table 5. Self-perceived risk of contracting COVID-19

| Variables                                         | Frequency (N=1022) | Percentage (%) |
|---------------------------------------------------|--------------------|----------------|
| **Self-perceived risk of contracting COVID-19**    |                    |                |
| No                                                | 859                | 84.1           |
| Yes                                               | 163                | 15.9           |
| **Reasons for not being at risk of contracting**  |                    |                |
| COVID-19*                                         |                    |                |
| I always avoid crowded places                      | 706                | 69.1           |
| I wash my hands always with soap under running    | 688                | 67.3           |
| Tap                                               |                    |                |
| I always take chloroquine, herbs and other        | 42                 | 4.1            |
| medications as preventive measures                |                    |                |
| I always use hand sanitizer                        | 486                | 47.6           |
| I always use face mask whenever I go out           | 218                | 21.3           |
| Others                                            | 123                | 12.0           |

Table 6. Adherence to COVID-19 preventive measures
| Variables                                              | Frequency | Percentage (%) |
|--------------------------------------------------------|-----------|----------------|
| Visitation to crowded place in recent times            |           |                |
| Yes                                                    | 194       | 19.0           |
| No                                                     | 828       | 81.0           |
| Regular hand washing with soap and water under a running tap |           |                |
| Very often                                             | 626       | 61.3           |
| Often                                                  | 297       | 29.1           |
| Sometimes                                              | 92        | 9.0            |
| Never                                                  | 7         | 0.7            |
| Use of hand sanitizer                                  |           |                |
| Always                                                 | 644       | 63.0           |
| Rarely                                                 | 328       | 32.1           |
| Never                                                  | 50        | 4.9            |
| Reasons for a rare or non-usage of hand sanitizer      |           |                |
| I can't afford it                                       | 101       | 9.9            |
| I don't know where to buy it                           | 4         | 0.4            |
| It is scarce to get                                     | 105       | 10.3           |
| It is not necessary                                     | 103       | 10.1           |
| Others                                                 | 65        | 6.4            |
| Wearing of face mask when leaving home in recent times  |           |                |
| Yes                                                    | 368       | 36.0           |
| No                                                     | 654       | 64.0           |
| Reasons for non-usage of face mask                     |           |                |
| I can't afford it                                       | 49        | 4.8            |
| Price hike                                             | 101       | 9.9            |
| I don't know how to use it                             | 4         | 0.4            |
| I don't know where to buy it                           | 50        | 4.9            |
| It is not necessary                                     | 334       | 32.7           |
| I have been indoor                                     | 90        | 8.8            |
| Others                                                 | 26        | 2.5            |
| Compliance with stay at home instruction from the government |           |                |
| Yes                                                    | 894       | 87.5           |
| No                                                     | 128       | 12.5           |
| Reasons for non-compliance with stay at home instructions |           |                |
| I earn daily income                                     | 33        | 3.2            |
| My employer is not releasing me from work               | 25        | 2.4            |
| I am on grade level 13 and above, so I have to go to work | 18        | 1.8            |
| I have urgent matters to attend to                      | 31        | 3.0            |
| I need to attend church or mosque                       | 2         | 0.2            |
| Others                                                 | 19        | 1.9            |

History of self-treatment with perceived preventive drugs against COVID-19 since the outbreak
| Yes | 288 | 28.2 |
|-----|-----|------|
| No  | 734 | 71.8 |

**Common medications used for self-prevention against of COVID-19**

|       | Yes (%) | No (%) |
|-------|---------|--------|
| Chloroquine | 16 | 1.6 |
| Antibiotics  | 17 | 1.7 |
| Vitamins     | 220 | 21.5 |
| Other        | 35  | 3.4 |

Table 7. Predictors of self-perceived risk of contracting COVID-19

| Self-perceived risk of contracting COVID-19 | P-value† | Adjusted OR (95% CI) ‡ | Adjusted P-value§ |
|--------------------------------------------|----------|------------------------|-------------------|
| Yes (%) | No (%) | | | |
| Age (years) | | | | |
| 18-39 | 14.7 | 85.3 | 1.00 (Reference) | |
| 40-59 | 18.7 | 81.3 | 0.111 | 2.05 (1.217-3.435) | 0.007* |
| ≥ 60  | 25.0 | 75.0 | 4.68 (1.888-11.583) | 0.001* |
| Gender | | | | |
| Male | 19.7 | 80.3 | 1.00 (Reference) | |
| Female | 11.6 | 88.4 | <0.0001 | 0.51 (0.352-0.751) | 0.001* |
| Marital status | | | | |
| Married | 14.9 | 85.1 | 0.53 (0.321-0.888) | 0.016* |
| Not married | 16.9 | 83.1 | 0.393 | 1.00 (Reference) | |
| Occupation | | | | |
| Trading | 18.8 | 81.2 | 1.318 (0.724-2.398) | 0.366 |
| Civil Servant | 16.7 | 83.3 | 1.00 (Reference) | |
| Farming | 9.5 | 90.5 | 0.597 | 0.360 (0.078-1.662) | 0.191 |
| Student | 16.6 | 83.4 | 1.201 (0.690-2.090) | 0.517 |
| Others | 13.4 | 86.6 | 0.700 (0.425-1.155) | 0.163 |

† P-value in Chi-square test; ‡ Adjusted odds ratio in logistic regression (confidence interval); § Adjusted P-value in logistic regression; *Significant values Others; Self-employed, unemployed
| Frequency of hearing about COVID-19 | Self-perceived risk of contracting COVID-19 | P-value<sup>2</sup> | Adjusted OR (95% CI)<sup>1</sup> | Adjusted P-value<sup>3</sup> |
|-----------------------------------|------------------------------------------|-----------------|-------------------------------|------------------|
| Very often                        | 17.0                                    | 83.0            | 1.00 (Reference)              |                  |
| Often                             | 13.3                                    | 86.7            | 0.159                         | 0.73 (0.430-1.207) | 0.213 |
| Sometimes/Never                   | 9.8                                     | 90.2            | 0.39 (0.125-1.199)            | 0.100            |
| Visitation to crowded place in recent times | 24.2                                    | 75.8            | 2.27 (1.499-3.448)            | <0.001*          |
| No                                | 14.0                                    | 86.0            | <0.0001                       | 1.00 (Reference) |
| Regular hand washing with soap and water under a running tap | 13.8                                    | 86.1            | 1.00 (Reference)              |                  |
| Very often                        | 18.5                                    | 81.5            | 0.125                         | 1.25 (0.835-1.863) | 0.280 |
| Sometimes                         | 21.7                                    | 78.3            | 0.125                         | 1.09 (0.926-3.096) | 0.887 |
| Never                             | 14.3                                    | 85.7            | 0.49 (0.056-4.342)            | 0.523            |
| Use of hand sanitizer             | 16.6                                    | 83.4            | 1.00 (Reference)              |                  |
| Always                            | 13.7                                    | 86.3            | 0.247                         | 0.70 (0.466-1.058) | 0.091 |
| Rarely                            | 22.0                                    | 78.0            | 1.29 (0.613-2.730)            | 0.099            |
| Compliance with stay at home instruction from the government | 15.2                                    | 84.8            | 1.00 (Reference)              |                  |
| Yes                               | 21.1                                    | 78.9            | 0.089                         | 1.16 (0.791-1.915) | 0.566 |
| No                                | 17.4                                    | 82.6            | 1.15 (0.782-1.691)            | 0.479            |
| History of self-treatment with perceived preventive drugs against COVID-19 since the outbreak | 15.4                                    | 84.6            | 0.440                         | 1.00 (Reference) |

<sup>1</sup>P-value in Chi-square test; <sup>2</sup>Adjusted odds ratio in logistic regression (confidence interval); <sup>3</sup>Adjusted P-value in logistic regression; *Significant values