



Knowledge, Attitude, and Perception of COVID-19 Pandemic in Enugu, Southeast Nigeria- The Initial Experience

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: The world is experiencing a global corona virus (COVID-19) pandemic. As of 9th June 2020, over 7 million confirmed cases of coronavirus disease (COVID-19) and more than 400,000 deaths had been reported in more than 30 countries of the world according to World Health Organization.

Aim: We aimed to assess the knowledge, attitudes, and vulnerability perception of Enugu state residents during the coronavirus outbreak in order to facilitate better health care outcomes.

Methodology: A prospective Web-based cross-sectional survey was designed for this study which was conducted in March 2020 among Enugu state residents. The obtained data were coded, validated, and analyzed using Statistical Package for the Social Sciences SPSS software, version 24. Descriptive analysis was applied to calculate the frequencies and proportions and **Chi-Square**

Test was also used. A preliminary phase was conducted to assess the validity and reliability of the questionnaire before its use.

Results: The study showed that significant number (99.6%) of the respondents had heard about Covid-19 and the most stated source of knowledge was social media (57.6%), followed by Newspaper and television shows (50.2%) while the least was from General Practitioner (GP) (8.9%). There was over 75% agreement with, and practice, of all known covid precautionary measures and less than 35% responses for wrong claims and practices about covid -19.

Conclusion: The overall knowledge, attitude, and perception are high in Enugu state population although few still has background combined superstitious believes. Social media and internet are the highest used facility for acquisition of knowledge and information in Enugu, Nigeria.

Keywords: Coronavirus; COVID-19; knowledge; attitude; perception; pandemic; Enugu; Southeast; Nigeria.

1. INTRODUCTION

The coronavirus disease (Covid-19) outbreak is the worst crisis globally after the second world war [1]. Initially, many Nigerians thought the disease was a distant 'white man's disease. Later it was regarded it as a 'big man's disease' (i.e., a disease of the very rich and influential persons only) [2,3,4,5]. Global health experts and eventually Nigerian government expressed concern about the spread of the novel Coronavirus disease and its potential for more than 7.6 million deaths in South Asia if no action were taken [6].

COVID- 19 is an emerging respiratory disease that is caused by a novel coronavirus and was first detected in December 2019 in Wuhan, China. Having no boundaries, this virus rapidly overwhelmed health systems in most parts of the world with health authorities clambering for intensive care beds, personal protective equipments and healthcare staff [7,8]. Nigeria reported its first COVID-19 case on 27th of February 2020 and numbers began to rise in late March 2020, [9], albeit at a low rate, which may be attributed to several government policies including stopping of all international flights and implementation of a nation-wide lockdown at an early stage of the pandemic. On the 11th of March 2020, the World Health Organization (WHO) proclaimed Covid -19 a pandemic disease [10]. By March 23rd, 2020, the confirmed infected people was 332,930 and the number of deaths 14,510 worldwide [11].

By early April 2020, Nigerian officials had identified several areas as hotspots of COVID-19 infections in the country. Nigeria faced threat of a serious outbreak due to deep challenges in practicing social distancing and access to water and soap for hand washing, with densely populated urban areas and a highly mobile

population in some states. The country announced an initial 3-week lockdown period on 31st of March 2021, which was extended to June 2020, triggering rapid migrations from the cities to rural areas in some parts of the country among rising fears of fast spread of infections. The extension of the initial lockdown period posed further challenges to the already distressed population and to ensuring strict compliance with social distancing guidelines.

Implementing personal hygiene and public health behaviors such as handwashing and sanitizing, wearing of face masks and social distancing are necessary to curb the spread of coronavirus, but it was challenging to practice these in many cities and rural areas in developing settings [12]. With sustained bans on large gatherings (including specific cultural and faith practices such as mass prayer gatherings, large weddings, large parties and funerals), these may create super-spreading events that accelerate transmission [13]. The testing capacity for Covid 19 cases varies from country to country therefore the number of reported confirmed cases, especially in third world countries, may be underestimated [14,15].

The coronaviruses have become the major pathogens of emerging respiratory disease outbreaks. They represent a large family of single-stranded RNA viruses, which can cause illness ranging from a common cold to severe symptoms like Middle East respiratory syndrome (MERS) and severe acute respiratory syndrome (SARS) [16]. The covid-19 disease may be asymptomatic, or present with mild respiratory symptoms or death [17]. It is highly contagious and a highly transmitted disease from human to human through respiratory droplets and direct contact with infected persons. This has resulted in many infected persons [18].

Clinical symptoms of COVID-19 include fever, which is the most common symptom, cough,

fatigue, malaise, shortness of breath, anosmia, myalgia, arthralgia, headache, sore throat, nausea, vomiting, altered consciousness etc. Global concerns about the virus have risen due to its high transmission capability, which is coupled with high morbidity and mortality [19]. The elderly and patients with comorbidities such as diabetes, hypertension, cancer, lungs, heart, or kidney diseases are more likely to be infected and are additionally more prone to serious complications, which may be associated with acute respiratory distress syndrome (ARDS) and cytokine storm [20,21,22,23] This disease markedly affects everyday life with resultant psychological, emotional, and socioeconomic crisis [1,24].

Perception shapes one's knowledge and acceptance of safety measures with regards to transmission of an infection [3]. Superstitious beliefs has contributed to shaping the perception of some Nigerians regarding the cause and mode of transmission of covid-19 [3,5].

At the time of this study, COVID-19 had no effective cure or vaccine, yet early recognition of symptoms and timely seeking of supportive care and preventive practices is critical to enhance recovery from the illness and combat the spread of the virus.

Awareness of the population must be increased with regards to surveillance, quick identification of suspected cases, patient isolation, rapid diagnosis, tracing, and follow-up of possible contacts [25,26].

The knowledge, attitudes, and practices of the people towards covid-19 is of utmost importance in evaluating the effectiveness, compliance and success of the infection prevention control Programme and help in supporting public health implementation and policy development in a sustained manner hence the purpose of this study in Enugu southeast, Nigeria.

This work aims to assess knowledge, attitudes, and perceptions about COVID-19 among a convenience sample of the general public in Enugu, southeast, Nigeria. The sample was distributed among Enugu East, Enugu North and Enugu South residents.

2. SUBJECTS AND METHODS

2.1 Study Design and Population

A cross-sectional survey was designed for this study of the general Enugu literate population

who has internet access and a computer (mobile phone, laptop). The study was conducted March to June 2020 among a Nigerian population. The survey was conducted through a link shared on social networking site using WhatsApp as well as through personal interviews. The latter was limited to limit the spread of the disease. The population size used in this study was 566 among Enugu state residents.

2.2 Study Tool

The survey questionnaire was designed, and it covered the socio demographic characteristics, knowledge regarding COVID-19, perceptions about the disease, and attitude towards protective measures against COVID-19.

2.3 Validation and Pilot Study

A preliminary phase was conducted to assess the validity and reliability of the questionnaire before its use. Initially, Eight Nigerian experts in the field of epidemiology and research in Nigerian universities were asked to assess the degree to which items in the questionnaires are relevant and can correctly measure knowledge, attitude and perception of the Nigerian public regarding COVID-19.

The next step was pretesting of the questionnaire on 20 participants who were excluded later from the study sample. They were asked to fill the questionnaire twice 2 weeks apart. Data were used to assess internal consistency reliability using Cronbach's alpha as well as test-retest reliability using the intra-class correlation coefficient. The results showed adequate internal consistency reliability (with Cronbach's alpha = 0.72 and the intra-class correlation coefficient was 0.96).

2.4 Data Collection

An online survey portal, Google Form was created, and participants were invited to complete and submit the form. A number of surveys were also collected through personal interviews. The process of calling participants to share in the survey was conducted through convenient sampling.

It started from three starting points simultaneously (GRA, Trans-Ekulu, Achara Layout) which roughly represent the main regions in Enugu State, i.e. North (GRA), East (Trans-Ekulu), South (Achara Layout). From

these three starting points, participants continued to spread and were expected to cover most of the governorates in the Enugu.

2.5 Sampling

The sample size was determined using the Epi Info 7 software. As there were no similar studies related to coronavirus disease, the calculations assumed that the probability of having good knowledge, attitude and perception towards coronavirus disease was 50.0% [10], at 95% confidence interval, limit of precision of 5%, with a design effect of 1.0, the calculated sample size was 566 participants. Accordingly, the survey portal was closed, and interviews stopped at the end of the day when the number of participants exceeded the sample size, i.e., at the end of the 4 months.

2.6 Statistical Analysis

Descriptive statistical methods were used to summarize data on socio-demographic characteristics, knowledge, attitude, and perception towards COVID-19. Data were summarized as frequencies (n) and percentages (%) for categorical variables.

The obtained data were coded, validated, and analyzed using Statistical Package for the Social Sciences SPSS software, version 24 (IBM, Armonk, NY, USA).

Descriptive analysis was applied to calculate the frequencies and proportions. Chi-Square Tests were also used for non-categorical variable.

2.7 Limitations

During the COVID-19 outbreak, it was not possible to collect data or conduct behavior change campaigns in person, to protect health workers and field-based staff. Behavior change messages had to rely on channels that do not require face-to-face interaction, such as SMS/WhatsApp, phone calls, radio, television, and social media. Our data collection was conducted on the phone if phone numbers are no longer functional. Also, our sample is representative of the UDAYA cohort, but not of the general population. Only households with an adolescent or young adult was eligible for inclusion in UDAYA, so for example, households with only elderly individuals or with only young children would not be included in UDAYA and

thus not including in the list of phone numbers for the COVID-19 survey.

3. RESULTS

3.1 Respondent Demographics

Of 566 samples, 52.6% were male and 47.4% were female. There were five age groups with above 35 years as the highest age group (50.9%). More than half of the participants (89.7%) were graduates. Additionally, 66.8% of participants were married at the time of the study. In terms of employment status, 55.1% of participants had a full-time job, 8.8% were students, (27.9%) were self-employed, 3% retired and 4.9% were unemployed.

3.2 Knowledge, Attitude, and perception of respondents towards COVID- 19

3.2.1 Knowledge

The study showed that significant number (99.6%) of the respondents had heard about Covid-19. The most stated source of knowledge was social media (57.6%), followed by Newspaper and television shows (50.2%) and other government websites of WHO & Nigerian Centre for Disease Control (NCDC) (42.4%). Other sources included friends or family members (27.9%), Religious worship centers (27.9) and mobile phone/ text messages (26.8) while the least was from General Practitioner (GP) (8.9%).

3.2.2 Attitude

In the study, it was observed that majority of the respondents believed and agreed that the following attitudes were important in controlling the spread of the COVID -19 Outbreak; Hand hygiene (100%), use of alcohol based sanitizer (99.6%), Social distancing (99.3%) , Disinfecting frequently contaminable surfaces in your environment like tables, chair , rails etc (98.9%) , avoiding touching of eyes , nose and mouth (97.5%), wearing masks (97.5%), physical and social distancing (97.5%), staying at home (96.5%) , praying to God (93.6%) and wearing hand glove (79.2%) is important in controlling the spread of the COVID -19 Outbreak.

On the other hand, Minority of the respondent (7.4%) thought that contacting COVID-19 in Nigeria was meant for the rich/wealthy people,

(15.5%) felt Africa cannot get COVID-19, (32.2%) also felt COVID-19 in Nigeria is another way for the government to make money and (35.7%) answered that they still stigmatize from recovered covid-19 patients.

More so, most of the respondent believed they have practiced these measures/ precautions towards COVID-19, (98.9%) Washing of hand with soap & water, (97.5%) Sanitizing hand with alcohol disinfectants, (95.1%) Social distancing, (92.9%) Staying at home, (89.4%) Avoid touching your eyes, ears & Mouth, (87.3%) Avoiding contacts 2m Distance from infected person, (82.0%) Wearing of face mask, (82.0%) Disinfecting frequently contaminating surfaces in your environment (Tables, Chair, Rails .etc), (83.7%) Taking of Vitamin C / Fruits, (66.1%) Wear gloves and protective, while minority of the respondents believed to have practiced, (1.8%) Drinking Palm oil, (8.5%) Taking of antibiotic / Chloroquine and drinking of Traditional herbs (13.1%).

Also most practiced measures were (52.7%) Washing of hand with soap & water, that is half of the respondents while other minority were (0.00%) drinking of Traditional herbs, (0.00%) Drinking Palm oil, (0.00%) Taking of antibiotic / Chloroquine and drinking of Traditional herbs, (0.4%) Avoiding contacts 2m Distance from infected person, (0.4%) Disinfecting frequently contaminating surfaces in your environment (Tables, Chair, Rails .etc), (0.7%) Wear gloves and protective, (2.1%) Taking of Vitamin C / Fruits, (2.5%), Avoid touching your eyes, ears & Mouth, (5.3%) Social distancing, (5.3%) Wearing of face mask, (8.1%) Sanitizing hand with alcohol disinfectants and (22.6%) Staying at home.

However, the study also showed that the respondents believed that the most effective precautional measure to curb COVID-19 is (39.9%) Washing of hand with soap & water and (34.6%) Staying at home whereas the other less effective precautional measure to curb COVID-19 were (0.00%) drinking of Traditional herbs, (0.00%) Drinking Palm oil, (0.00%) Taking of antibiotic / Chloroquine and drinking of Traditional herbs, (0.4%) Disinfecting frequently contaminating surfaces in your environment (Tables, Chair, Rails .etc), (1.1%) Wear gloves and protective, (1.8%) Avoiding contacts 2m Distance from infected person, (2.8%) Taking of Vitamin C / Fruits, (3.2%) Sanitizing hand with alcohol disinfectants, (4.9%) Wearing of face mask, (7.8%) Social distancing.

3.2.3 Perception

It was observed that significant number perceived that the cause of COVID-19 was Virus (96.8%) while the minor cause were Bat (27.9%), Evil Doing (14.5%), God/ other higher power (12.4%), Curse (8.5%) and witchcraft (2.1%) (Supplementary Table 1)

Majority of the respondents (99.30%) also perceived COVID -19 outbreaks as dangerous. Majority of the respondents (82.3%) accepted that COVID-19 can be transmitted through air, contact, and fecal-oral routes. About (96.10%) of the respondents answered that headache, fever, cough, sore throat, flu were symptoms of COVID-19. Also (95.40%) of the respondents agreed that incubation period for COVID-19 is 2-14 days. (96.8%) of the respondents also believed that COVID -19 can lead to pneumonia, respiratory failure, and death. However (86.9%) of the respondent feels that Supportive care is the current treatment for COVID -19.

It was observed in the study that half of the respondents (50.2%) perceived to be very worried of contacting COVID-19, while (30.7%), A little worried and (19.1%) Not worried at all. Majority of the respondents (83.4%) said they would like to learn more about COVID-19

3.3 Demographic Factors Influence on Knowledge, Attitude, and Perception of Respondents on COVID-19

Table 1, study participant showed that Chi-Square ($X^2(2) > = 1.805$, $p = 0.179$) implying that there is no relationship between the level of knowledge and gender.

The Chi-Square ($X^2(2) > = 11.202$, $p = 0.024$) shows that there is a positive relationship between the level of knowledge and age.

The Chi-Square ($X^2(2) > = 4.675$, $p = 0.457$) shows that there is no significant relationship between the level of knowledge and occupation.

The Chi-Square ($X^2(2) > = 0.998$, $p = 0.910$) shows that there is no significant relationship between the level of knowledge and Marital status.

Table 2, study participant on perception showed that Chi-Square ($X^2(2) > = 1.090$, $p = 0.779$) implying that there is no relationship between gender and perception.

Table 1. Analysis of demographic characteristics as factors influencing the knowledge levels of respondents from Enugu towards the COVID-19 pandemic

Variables	N	Satisfactory (%)	Unsatisfactory (%)	(X ²) value	P-Value
Gender					
Female	268	(47.3)	(0.0)	1.805 ^a	0.179
Male	298	(52.3)	(0.4)		
Age (years)					
15-18 years	2	(0.4)	(0.0)	11.202 ^a	0.024*
19-24years	44	(7.8)	(0.0)		
25-30 years	86	(14.8)	(0.4)		
31-35years	146	(25.8)	(0.0)		
Above 35 years	288	(50.9)	(0.0)		
Occupation					
Student	50	(8.8)	(0.0)	4.675 ^a	0.457
Unemployed	28	(4.9)	(0.4)		
Self-Employed	158	(27.9)	(0.0)		
Civil Servants	170	(29.7)	(0.0)		
Health Worker	142	(25.1)	(0.0)		
Retired	18	(3.2)	(0.0)		
Marital Status					
Single	174	(30.7)	(0.0)	0.998 ^a	0.910
Married	378	(66.4)	(0.4)		
Divorce	4	(0.7)	(0.0)		
Separated	4	(0.7)	(0.0)		
Widowed	6	(1.1)	(0.0)		

*Statistically significant ($p < 0.05$)**Table 2. Analysis of demographic characteristics as factors influencing the perception of respondents from Enugu towards the COVID-19 pandemic**

Variables	N	Perception (%)	(X ²) value	P-Value
Gender				
Female	268	(47.4)	1.090	0.779
Male	298	(52.6)		
Age (years)				
15-18 years	2	(0.4)	24.221	0.019*
19-24years	44	(7.8)		
25-30 years	86	(15.2)		
31-35years	146	(25.8)		
Above 35 years	288	(50.8)		
Occupation				
Student	50	(8.9)	26.608	0.032*
Unemployed	28	(4.9)		
Self-Employed	158	(27.9)		
Civil Servants	170	(30.0)		
Health Worker	142	(25.1)		
Retired	18	(4.9)		
Education				
FLSC	2	(0.4)	40.687	0.0001*
O' Level	26	(4.6)		
OND	32	(5.7)		
B.Sc. /HND	284	(49.9)		
M.Sc.	150	(26.6)		
PhD	72	(12.8)		

*Statistically significant ($p < 0.05$)

The Chi-Square ($\chi^2(2)$) = 24.221, $p = 0.019$ shows that there is a positive relationship between age and perception.

The Chi-Square ($\chi^2(2)$) = 26.608, $p = 0.032$ shows that there is a relationship between occupation and perception.

The Chi-Square ($\chi^2(2)$) = 40.687, $p = 0.0001$ shows that there is a positive relationship between the level of education and perception.

4. DISCUSSION

Covid-19 is a global pandemic [27]. This cross-sectional survey gives an insight into the knowledge, attitudes, and perception of covid-19 in Enugu southeast Nigeria. From our study, the indicator with the greatest impact is perception. Age has a significant relationship with all the indicators.

This study shows that the highest knowledge of covid-19 was in persons above 35 years of age. This is slightly like reports in Northcentral Nigeria [2] but contrary to a study in western Nigeria where the highest knowledge was found in the lower age group of 21-30 years age [28].

Our finding showed that there is good awareness and knowledge of this virus. This is similar to studies done in Northcentral Nigeria [2], western Nigeria [28], Sierra Leone [14], and Saudi Arabia [29]. Some other studies done in healthcare workers and medical students also demonstrated good knowledge [30]. However, there is very poor knowledge in Northwest Ethiopia- although this study was carried out among patients with chronic diseases [1]. Poor knowledge and poor practice were also noted in the Iranians among males, persons with low level of education, the elderly, and the very poor individuals [17].

The highest source of knowledge in our study is via social media and internet. This is in comparison to studies in Northcentral Nigeria, Jordan, and Ghana [2,31,32] but in contrast to that of Sierra Leone and Philippines where the highest source of knowledge is via radio and television [14,33].

This study demonstrated that majority of our people agree with the safety precautionary measures of hand and personal hygiene, use of hand sanitizers, wearing of face masks, social distancing, staying at home unless absolutely necessary etc. This is similar to work reported

from South Korea [34]. A few percentage of our respondents think that the corona virus is a disease of the wealthy and influential class only. While others think that Africa cannot get the virus and yet few others think it is another way for the government to make money. The report from western Nigeria showed that some of the participants perceived it as an exaggerated condition [3].

Virtually all participants believe hand washing with soap and water is a practiced measure for prevention. This agrees with some studies [2,14,35]. while in the report in western Nigeria, [3] as low as 20.8% of the participants believed in handwashing.

Although a high percentage of our participants believe in the use of hand sanitizers, only 32.9% of a study from Cameroon believe in its use [36]. A good number of our participants believe in the wearing of face masks. This agrees with some reports [2,37]. but contrary to other studies that demonstrated very low belief of wearing of face mask [37,38]. The later believed that only Covid infected patients should wear face masks and not everybody.

The most practiced precautionary measure in our study is washing of hands with soap and water, while that in the western Nigeria study is use of face mask and use of hand sanitizers is the most practiced in Northcentral Nigeria.

Although a high number of our participants perceive the origin of the infection to be viral, yet a few still perceives a possibility of it being from bat, because of evil doing, sent to humans from a higher power, as a curse from the gods and also witchcraft. This shows that even among our educated population, few entertained superstitious believes.

This study demonstrates that there is a very high awareness of the hazard of covid 19. The study in Jordan is also in agreement with participants believing that all is at risk. There is a high appreciation of the mode of transmission from this study which agrees with other reports [2,37]. Our reports have shown a high knowledge of the incubation period and symptoms of the infection and so were those reports in Northcentral Nigeria [2,39]. However, the Iranian study demonstrated a very poor knowledge of these symptoms.

At the time of this study, only a little over half of our respondents were very worried about the

disease while a few were not at all. This is like the report from Iran [17]. However other studies show a very high percentage of the participants being very worried and even scared [24,39]. The study in Sierra Leone shows that they did not know that one can survive covid infection [14].

To the best of our knowledge, no data has been published on the initial knowledge, practice and perceptions of covid-19 infection among the general inhabitants in Enugu: Therefore, this act as a guide.

5. CONCLUSION

Nigeria has joined the international world in fight against covid-19 pandemic. The overall knowledge, practice and perception are high in Enugu state population although few still has background combined superstitious believes. Social media and internet are the highest used facility for acquisition of knowledge and information in Enugu.

6. RECOMMENDATIONS

There is need for further studies of other groups such as those in rural areas, the illiterate, less privileged, those without internet access, patients with chronic illnesses, the elderly, barracks staff, cognitive disabled persons, and refugees, with respect to covid-19 infection.

- An aggressive government response and effective contact tracing would help keep the virus in check.
- Strong public awareness campaigns, with early engagement of traditional, religious and community leaders, will also play a major role in successful containment of this outbreak.
- Risk reduction messaging should focus on several factors: reducing the risk of human-to-human transmission; outbreak containment measures.
- The use of the local language of the people as an effective means of spreading messages about the virus should be encouraged.
- Clarifying misconceptions surrounding the knowledge, attitudes and practices of the people is advised.
- Focus should be drawn to addressing community acceptance of COVID-19 affected people.
- Maximize the use of the mass media to pass across messages to the people,

especially the radio and television to pass messages across as well as the use of the television to enable survivors tell their stories.

- Community ownership and participation should be encouraged especially at the grassroots level as this will give a clearer picture of the Enugu situation as regards to covid-19 knowledge, attitudes, and practices.
- Government should make provision for testing tools and extending the creation of more testing centers within the grassroots.
- The health professionals and the Ministry of health are key to providing information to the general public.

7. THE LIMITATIONS

The very poor and under privileged persons were not included in this study due to their limited access to internet facility.

CONSENT

Respondents' anonymity and confidentiality were ensured. The submission of the answered survey was considered as consent to participate in the study.

ETHICAL APPROVAL

This study was approved by the Ethics Committee of University of Nigeria Teaching Hospital.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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