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Original Research Article

Online survey of Covid-19 among residents of Plateau state, Nigeria: An assessment of knowledge, perception and prevention practices

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Abstract

Background: The global pandemic of COVID-19 has continued to spread across the world due to its highly infectious nature. Its control as of present is dependent on measures that involve banning of large gatherings, physical distancing, hand hygiene, cough hygiene and restrictions of movement. This requires that the general public is made aware of these strategies and adheres to them strictly. This study aimed to generate information on the knowledge base, perception, and prevalent practices in Plateau State of Nigeria.

Methodology: It was a cross-sectional survey in which responses were obtained through an online platform from adult residents of the State. Knowledge, perceptions and prevention practices of COVID-19 were assessed and analysed using Microsoft Excel and Epi-Info 7.2.3.1 at a significance level of $p < 0.05$

Results: Responses were obtained from 732 participants. Sixteen out of the 17 local government areas of the State were captured. The age group 21-50 year made up 85% of the respondents and all had some level of education. The mean level of knowledge was 24.5 ± 3.9 and was significantly associated with age and level of education. Perceptions and practices were however not commensurate with the high level of knowledge.

Conclusion: There is a need to increase awareness efforts to fill knowledge gaps and dispel some misconceptions and there is a need for a reciprocal improvement by the residents to adapt the practices that are needed to ensure that the disease is brought under control.

Keywords: COVID-19, knowledge, perception, practice, residents, Plateau State, Nigeria.

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1. Introduction

The emerging coronavirus disease 2019 (COVID-19), which has assumed a pandemic level, has its genesis linked to Wuhan in Hubei Province of China where it was first identified.[1] The disease is caused by the severe acute respiratory syndrome coronavirus 2 (SARS CoV-2), a member of the coronavirus family. Phylogenetic studies suggest that it is a zoonotic disease with human to human transmission occurring via droplets and contact with contaminated surfaces. Although faecal isolation of viable virus has been achieved, faeco-oral transmission of the virus has not been substantiated.[2] It causes symptoms such as cough, fever, cough, fatigue, headache, myalgia, loss of taste or smell, shortness of breath and diarrhoea.[3] It is a highly infectious disease, more infectious than other members of the coronavirus family but less fatal with a case fatality rate of 3% compared to SARS(9.5%) and MERS (34.4%) though it varies between countries.[4,5] Although the disease affects people of all ages and social class, it is however of greater severity in the elderly and those with comorbidity. With the establishment of community transmission and its high infectivity, the spread has been alarming. The world is yet to record a breakthrough in the development of an approved drug and vaccine for the disease,[6] with supportive care being the hallmark of treatment for now. Since its emergence, the disease has spread rapidly to several countries in Europe, Asia, America, Africa and Oceania. It was initially declared a public health emergency of international concern on the 30th of January 2020 and on the 11th of March, the World Health Organization (WHO) further declared it a pandemic.[7]

At the early stage of the disease, Nigeria and other sub-Saharan countries recorded little or no cases of the COVID-19. However, the tide has changed as more cases are being recorded in the region. As of April 2020, community transmission has been reported in some sub-Saharan Africa countries by the World Health Organisation.[8] In Nigeria, the first reported case was on the 27th of February, in an Italian who came into the country two days before diagnosis.[9] The rise in the incident cases initially was slow in the country; however, the rise has taken a new dimension with daily incident cases now in the range of tens, hundreds and thousands. Plateau State currently has 2,245 confirmed cases as of 27th August, 2020 after recording its first case on the 22nd of April, 2020.[10,11] The State government had however put in place a lock down and a restriction of movement into the State prior to the confirmation of its first case.

Nigeria has taken some measures in the fight against the pandemic. Some of the measures were practically an adoption of what has been done or still being done in some earlier hit countries in Europe, Asia, and America. These measures include total or partial lockdown of some states in the country, banning of all social gatherings and religious gatherings, closure of schools and large markets, public enlightenment and raising awareness on hand hygiene, physical distancing, cough hygiene, and avoidance of hand contact with the face. The strictness of enforcement of these measures depends on the peculiarities of each state in terms of the number of confirmed cases, proximity to worse hit States, and perceived vulnerability by the government of that state. Due to the high transmissibility of COVID-19, the success of these measures is of grave importance. Despite the above measures, the number of cases is still on the rise. As at 27th August 2020, the total number of confirmed cases in the country was 53,021 with 40,281 discharged cases and 1,010 deaths recorded.[12]

Nigeria is a multi-ethnic society with diverse, deep-rooted cultural and religious beliefs. These belief systems shape the health-seeking behaviour and perception of health risk. It is therefore expected that the level of awareness, perception of the disease and adherence to COVID-19 preventive measures in Nigeria will be influenced by such factors. Implementation of outlined measures will in no doubt curb the spread of the disease but compliance may depend on the disposition and actions of the populace. Being a novel disease, discoveries are rolling out and the knowledge base of the disease is being updated as events unfold. Poor knowledge and understanding of the disease coupled with ignorance and denials may increase a person's vulnerability. Perceptions of the general risk of infection and disease can be influenced by uncertainty of the outcome and would ultimately shape the protective and preventive behaviour adapted by individuals.[13]

The health indices of Nigeria is relatively poor; life expectancy at birth in Nigeria is 54 years, infant mortality rate is 67/1000 live births, maternal mortality ratio of 512/100,000 live births and more than 70% of the population live below the poverty line of less than two dollars per day.[14,15] The coronavirus pandemic presents with a dual crises affecting both the health and the economy of nations leading to an escalated need for healthcare services amidst rising fatalities, and worsening poverty levels. Other peculiar challenges abound in a developing country like Nigeria. Less-educated households living in crowded spaces, with dependence on daily-wages means of livelihood, serve as a barrier to effective implementation of control measures. Of particular note are the teeming population living in urban slums with a disproportionately high risk of transmission of COVID-19.[8]

The presence and extent of behavioural change and adaptation in the general population is currently unclear and an issue of concern in the face of the rising wave of the pandemic. As attention is channelled towards flattening the epidemic curve and enabling the capacity of the health system in responding to the pandemic, understanding the level of knowledge and perception of the general population

will guide policy and strategy measures being implemented for the control of the pandemic. Given the human tendency to resist perceived unfavourable change, it is important to assess the perception and level of adherence to the preventive measures.[16] The aim of the study was to assess the knowledge and perception of covid-19 and its control practices in the general population of Plateau State.

2. Methodology

This was a cross-sectional survey carried out in Plateau State, Nigeria, one of the 36 states of the country located in its North Central region with an estimated population of 3.5 million.[17] It has 17 Local Government Areas (LGAs) and is home to over forty ethno-linguistic groups. Male and female adults of 18 years and above who are currently residents in the State were eligible to participate in the study. A minimum sample size of 152 was calculated using the formula for cross-sectional studies ($n = z^2pq/d^2$) where the prevalence (p) was derived from another study that looked at the knowledge of COVID-19 in the general population.[18] Data was collected with the use of Google forms, an online data collection tool. The form was distributed on multiple social media platforms including Facebook, WhatsApp and Twitter and data collected from those who responded to the request to fill the form. Responses were accepted between the 11th and 25th of April, 2020, a period when lockdown measures were in place in the State. The data collection tool had sections on respondent's socio-demographics, knowledge of transmission and prevention of COVID-19, perception of the disease and prevention practices towards COVID-19. Knowledge scores were obtained out of a total attainable score of 32. Each correct answer was scored as 1 while incorrect answers or 'don't know' were scored as 0. The mean of scores were obtained and used for comparison. Data was analysed using Microsoft Excel and Epi-Info 7.2.3.1 with the level of significance set at $p < 0.05$. Frequency tables and charts were used to present data and ANOVA test was used to test for association between mean knowledge scores and socio-demographic features of the respondents. Ethical clearance was obtained from the Jos University Teaching Hospital (JUTH) Human Research and Ethics Committee (Ref no: JUTH/DCS/IREC/127/XXXI/2187). A consent page was included in the form and those who declined to participate were exited from the survey.

3. Results

A total of 732 responses were obtained. Responses were obtained from 16 out of the 17 LGAs of the State with 294 (40.1%) and 225 (30.7%) coming from Jos South and Jos North respectively. Most of the responses came from those aged 21- 50 years making up 85% of respondents. Those in the age group 31 – 40 years made up the largest group. There were more males than females. Three hundred and fifty two respondents (48%) had obtained tertiary level of education while a further 357 (49%) had obtained postgraduate education. (Table 1)

Table 1: Socio-demographic characteristics of respondents

Variable	Freq	(%)
Age		
18 - 20	9	(1.2)
21 - 30	118	(16.1)
31 - 40	294	(40.2)
41 - 50	207	(28.3)
51 - 60	87	(11.9)
61 - 70	16	(2.2)
71 and above	1	(0.1)
Sex		
Female	213	(29.1)
Male	519	(70.9)
Highest level of education		
Postgraduate	357	(48.8)
Secondary	23	(3.1)
Tertiary	352	(48.1)
LGA of residence		
Barkin Ladi	14	(1.9)
Bassa	11	(1.5)
Bokkos	17	(2.3)
Jos East	9	(1.2)
Jos North	225	(30.7)
Jos South	294	(40.2)
Kanam	7	(0.9)
Kanke	30	(4.1)
Langtang North	12	(1.6)
Langtang South	2	(0.3)
Mangu	60	(8.2)
Mikang	4	(0.6)
Pankshin	19	(2.6)
Qua'an Pan	13	(1.8)
Riyom	5	(0.7
Shendam	10	(1.4)

The mean level of knowledge was 24.5 ± 3.9 and this was found to be significantly associated with increasing age and higher level of education as shown in Table 2.

Table 2: Relationship between mean knowledge scores and selected socio-demographic characteristics

Variable	Freq	(%)	Mean Knowledge Scores	p-value
Age				
18 - 20	9	(1.2)	22.7 ± 5.2	
21 - 30	118	(16.1)	23.2 ± 4.2	
31 - 40	294	(40.2)	24.5 ± 4.2	0.0000
41 - 50	207	(28.3)	24.8 ± 3.3	
51 - 60	87	(11.9)	25.1 ± 3.2	
61 and above	17	(2.2)	24.2 ± 3.5	
Sex				
Female	213	(29.1)	27.0 ± 4.1	0.31991
Male	519	(70.9)	27.0 ± 3.8	
Highest level of education				
Postgraduate	357	(48.8)	25.0 ± 3.5	
Secondary	23	(3.1)	21.5 ± 5.3	0.00000
Tertiary	352	(48.1)	24.0 ± 4.1	

Sources of information (Figure 1) included television (664, 90.7%), social media (602, 82.2%), radio (547, 74.7%), NCDC website (538, 73.5%), WHO website (453, 61.9%), friends (3778, 51.6%), family (331, 45.2%), Ministry of Health (306. 41.8%), work colleagues (300, 41%), and posters/handbills (245, 33%).

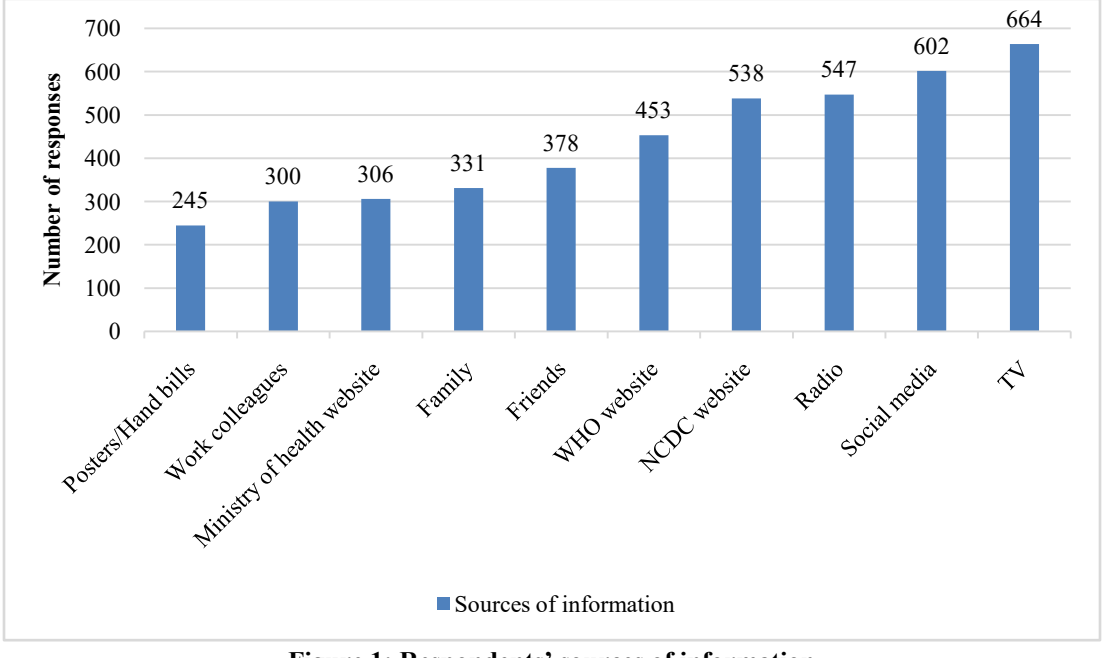

Figure 1: Respondents' sources of information

The symptoms of COVID-19 most identified by respondents as shown in Figure 2 were fever (707, 96.6%), difficulty in breathing (704, 96.2%), cough (703, 96%) and sore throat (608, 83.1%).

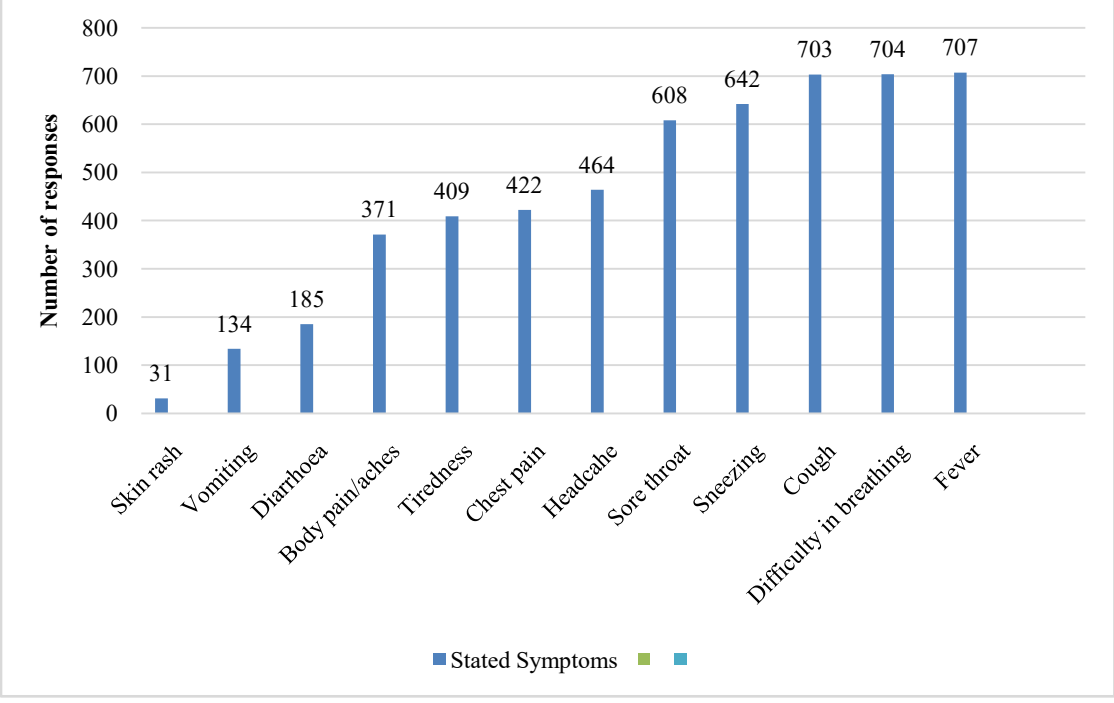

Figure 2: Responses on symptoms of COVID-19

Modes of transmission (Figure 3) stated more frequently by respondents included inhaling droplets from an infected person (679, 92.8%), close contact with an infected person (663, 90.6%) and touching objects or surfaces where COVID-19 droplets have contaminated (650, 88.8%).

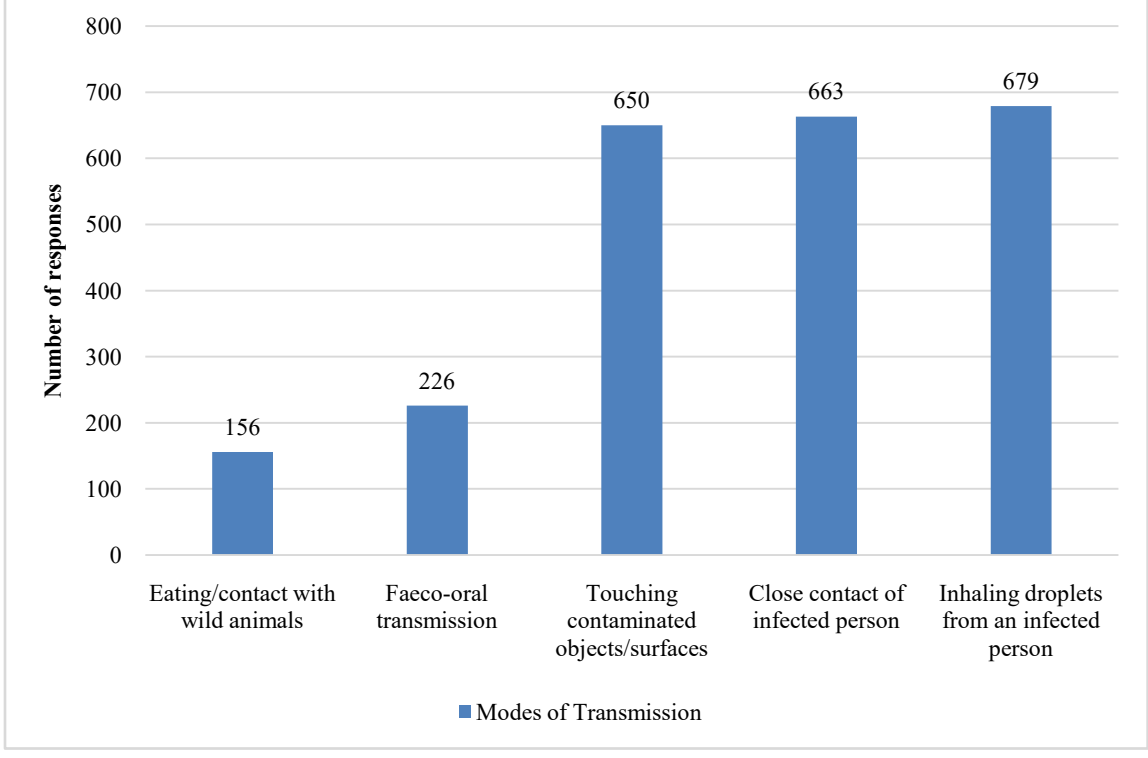

Figure 3: Modes of transmission of COVID-19 stated by respondents

Methods of prevention that were mentioned most frequently were regular hand washing (728, 99.5%), regular use of hand sanitizers (724, 98.9%), avoiding crowded places, keeping a 2 meter distance from others (711, 97.1%), covering the mouth with a bent elbow (687, (93.9%) and not touching the face with your hands (661, 90.3%). Others are as shown in Figure 4.

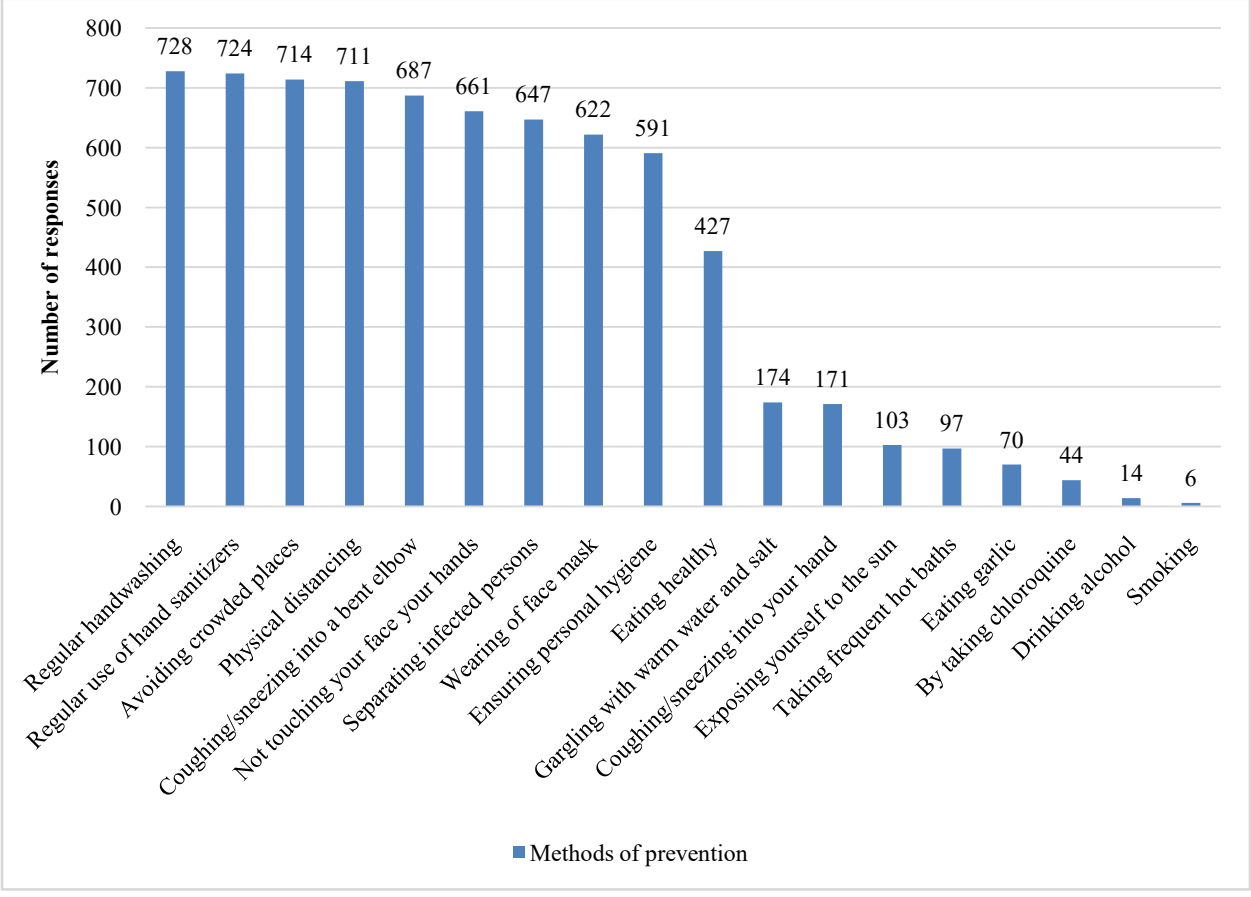

Figure 4: Methods of prevention of COVID-19 infection stated by respondents

Those most likely to have severe forms of the disease that were stated by respondents the most were the elderly (510, 69.7%) and those with co-morbidities (519, 70.9%). (Figure 5)

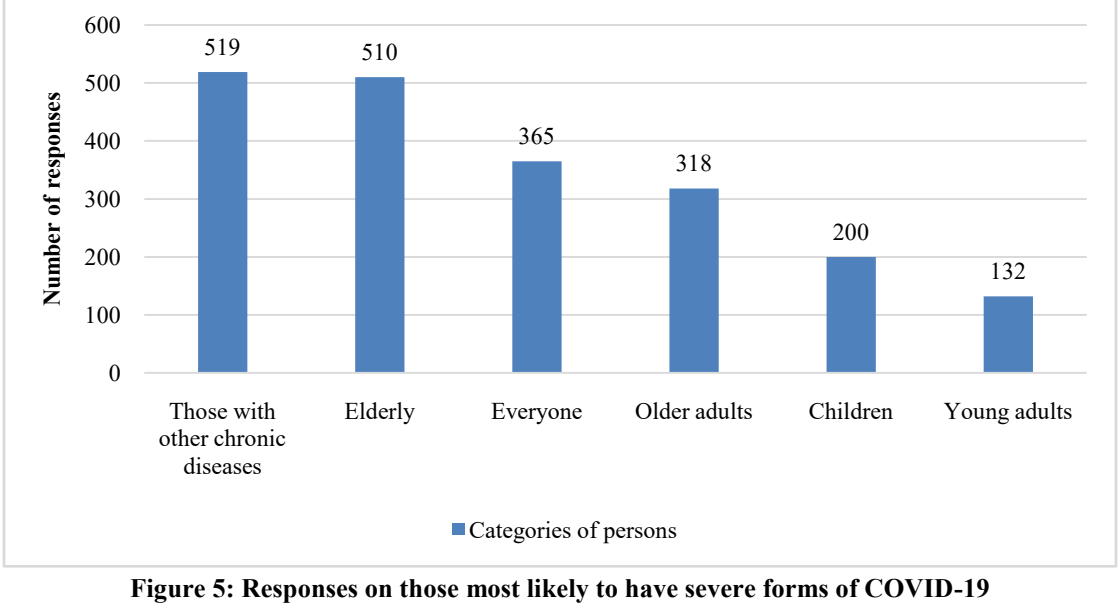

Figure 5: Responses on those most likely to have severe forms of COVID-19

Three hundred and eight (42.1%) respondents strongly disagreed that they were immune to COVID-19. Less than half (361, 49.3%) strongly agreed that they are well informed about COVID-19. More than 70% of respondents strongly agreed that they would present themselves for screening if exposed to COVID-19 and be willing to self-isolate if asked to do so. Less than 40% agreed that both Nigeria and Plateau State governments can contain the epidemic in the country. However, 300 (41%) strongly agreed and 260 (35.5%) agreed with the lockdown measures that have been introduced by the State government are good. (Table 3)

Table 3: Perception of respondents on COVID-19

Statement (n = 732)	Agree	Strongly agree	Neutral	Disagree	Strongly Disagree
I am immune to COVID-19	47 (6.4)	55 (7.5)	111 (15.2)	211 (28.8)	308 (42.1)
I believe I am well informed about COVID-19	343 (46.9)	361 (49.3)	25 (3.4)	3 (0.4)	0 (0.0)
I will present myself for screening if I think I have been exposed to COVID-19	173 (23.6)	542 (74.0)	8 (1.1)	4 (0.6)	5 (0.7)
I am willing to self-isolate if I am asked to so	158 (21.6)	559 (76.4)	9 (1.2)	3 (0.4)	3 (0.4)
Nigeria can successfully contain the epidemic in the country	282 (38.5)	206 (28.1)	151 (20.6)	52 (7.1)	41 (5.6)
Plateau State can successfully contain the epidemic in the country	275 (37.6)	187 (25.6)	163 (22.3)	65 (8.9)	187 (25.6)
The lock down measures introduced by the State government are good	260 (35.5)	300 (41.0)	101 (13.8)	39 (5.3)	32 (4.4)

Less than 20% stated that they regularly visit crowded places (116, 15.8%) and attendance at religious services (96, 13.1%). Ninety five percent (696) regularly wash their hands and use hand sanitizers, also, 71% consistently carries hand sanitizers. Three hundred and eighteen (43.4%) are able to maintain physical distance of meters at all times. Four hundred and seventy-eight (65.3%) cough and sneeze into a tissue or bent elbow and 58 (7.9%) spit in public places. The contact numbers for calling health authorities for COVID-19 is available but up to 40% (247) do not have the contact numbers. (Table 4)

Table 4: Practice of prevention of COVID-19 by respondents

Statement	Yes	No	Sometimes
Regularly visits to crowded places e.g. markets, ceremonies	116 (15.8)	616 (84.2)	-
Attendance at religious services	96 (13.1)	636 (86.9)	-
Regular handwashing or use of hand sanitizer	696 (95.1)	36 (4.9)	-
Consistently carries a hand sanitizer	520 (71.0)	212 (29.0)	-
Able to maintain physical distance of 2 meters at all times	318 (43.4)	44 (6.0)	370 (50.6)
Spitting in public places	58 (7.9)	674 (92.1)	-
Coughing/ sneezing into a tissue or bent elbow	478 (65.3)	50 (6.8)	204 (27.9)
Have the contact numbers of health authorities	482 (66.1)	247 (33.9)	-

4. Discussion

In this study, despite having used the google non-personal method of data collection, we were able to get respondents far more than the calculated minimum sample size. This shows the grave concern attached to the pandemic by the masses. This high level of respondence was observed in a similar study in the United Kingdom (UK) and United States of America (USA) that had 3000 participants recruited through electronic means.[19] Another study in Nigeria that recruited via similar electronic online means had 1375 respondents as much as 1403 with 1357 included in the study.[20] In the face of the enormous time required to administer questionnaires personally especially with a ravaging pandemic like covid-19, this method of online administration has proven to be a reliable means of drawing the required response within a limited time.

The respondents of this study were predominantly males and most with minimum of tertiary level of education. Although this male gender preponderance differed with what was obtained in a study in China during their peak of transmission,[18] it was however in tandem with the findings of a similar study in Nigeria that had 58% male respondents.[20] The issue of COVID-19 being a front burner issue notwithstanding, the level of disposal and availability of time to attend to such matters online might be connected to the observed male preponderance in a typical African setting given the sociocultural and economic background and gender roles. Similar level of education was observed in other cited studies above,

showing that the assessment of these materials online come with increasing level of education, especially when it requires specific informative sites. This may also be a limitation as it excludes responses from the uneducated and the poor who do not have such facilities at their disposal.

The mean level of knowledge was 24.5± 3.9 which is higher than two-thirds the maximum score of 32. This is in consonance with a previous study in Nigeria that had good knowledge of COVID-19. Knowledge expectedly was shown to be significantly associated with higher educational level and age but not with gender. The degree of variation from the mean across all the age range was narrow showing they all had similar knowledge of the pandemic, both young and old and they all consider it an issue of importance to about the same degree. With a population like this that are ready to imbibe all available information on the pandemic and be abreast almost all at the same level, the importance of reliable information communication cannot be overemphasized especially in the face of possible spread of myths.

The level of education of most respondents might have played a role in having most of them seek information from more reliable sources like televisions, radio, and designated sites; with lesser proportion sourcing from friends and family. This however might not be a true reflection of the masses response had the less educated and poor been proportionately represented, as they might not readily have access to such sites and media.

While most were aware of the symptoms, mode of transmission and preventive measure of the disease some still held on to unsubstantiated claims like the use of garlic and smoking in preventing COVID-19. Also, the disposition of a few towards the early diagnosis is still below par. These groups, no matter how few, are a significant few that can neutralize measures being instituted to tackle the pandemic especially in the face of community transmission. The control is such that requires all hands being on deck as it takes only a single case in a new environment (index case) to propagate the infection. Public health measure targeted at bursting all myths and educating this significantly variant few must be seen as an important task.

That severity of the disease increases with age and comorbidity was understood by more than two thirds of the participants. As good as this information is, it may also have its down side if not backed up by the right attitude. Some youths that feel less vulnerable might decide to jettison all necessary control measure like avoiding visits to overcrowded areas (as about 15% still regularly visit those areas from the study findings). This will no doubt dampen the effect of the control measures on ground.

While most of the respondents believe they are well informed on the subject matter (about 95%), more than one-tenth still feel they are immune to the disease. This variance from established fact on conference of immunity shows that some of the indications by the respondents on the level of awareness might actually be subjective to some extent. Though a large proportion agreed with the lock down measures introduced by the State government are good, only close to half believed that both the State and National Governments would be able to contain the pandemic in the country. Another finding that could hamper the efforts State's effort was that a sizseable portion of respondents did not have the emergency contact numbers for health authorities. Hence there is need for continuous information dissemination and risk communication as attested to by more than half of the respondents that admitted to the need for more information sharing.

Despite the high level of knowledge, many could not adhere to the guidelines that have been laid and advocated for in the control of the epidemic. In particular, less than half are able to maintain physical distances which are not surprising considering the crowed nature of our living conditions and public spaces. Knowledge is known to not always translate into action and is an interplay of various factors that are embedded in the health belief model.[21-23]

The study had some limitations. More than 70% of respondents were drawn from just two local government areas while one local government area had no respondents. Hence, the distribution of participants was not proportionate to size. Also, most respondents were drawn from the highly educated class thereby bringing to question the generalizability of the study findings. In the area of practice, respondents may provide answers that they believe are expected not necessarily what they do leading to social desirability bias.

5. Conclusion

This study found a high knowledge of COVID-19 among the residents of Plateau State. This knowledge was not supported by consistent good preventive practices. Tertiary education and middle age were found to be good indicators for knowledge of COVID-19 acceptable perception and practices. Individuals with such qualities could be used to reach the rest of the population with information on prevention strategies of COVID-19.

Conflict of Interest

The authors declare no conflict of interest.

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