

## ORIGINAL ARTICLE



# Knowledge and perception of COVID-19 and its treatment. A community-based survey in South Nigeria

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### Abstract

**Background:** Media channels increased COVID-19 pandemic uncertainty and disputes, hindering dissemination and acceptance of evidence-based health information. Socioeconomic, cultural, and developmental factors affect a community's access to credible health information. This community-based study aims to assess semi-urban residents' understanding of COVID-19.

**Methods.** This was a cross-sectional study of 384 multistage-sampled residents of the study site. Sociodemographic, psychographic, and COVID-19 and treatment knowledge were obtained using a semi-structured questionnaire. Six questions were used to measure knowledge, which was deemed adequate (three or more correct answers) or inadequate (fewer than three correct responses).

**Results:** 54 out of 364 responders (14.8%) knew COVID-19. 68.9% of respondents stated citrus fruits or spices, 46.1% mentioned infection safety, and 13.3% mentioned chloroquine for prevention. Regarding treatment, 55.5% of responders reported chloroquine and 20.9% hydroxychloroquine. 17% chose "none of the above." Class I workers were four times more likely to have adequate knowledge than class V workers ( $p=0.019$ ), while class III workers were 79% less likely ( $p=0.046$ ). Males had 68% less knowledge than females ( $p=0.008$ ).

**Conclusions:** In this study, adequate knowledge of COVID-19 was low and associated with higher socioeconomic class. Key words: COVID19 knowledge, COVID19 perception, COVID-19 treatment, COVID19 medications, COVID19 prevention, Self-medication.

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## INTRODUCTION

The prediction of emerging disease pandemics<sup>1,2</sup> was confirmed in December 2019 with the emergence of the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in Wuhan, China.<sup>3</sup> Most health systems worldwide were unprepared for the emergence of the SARS-CoV-2 virus resulting in its widespread devastating effects, associated with anxiety and fear in the global community. The anxiety and fear were particularly due to a lack of scientifically proven preventive or treatment options and poor understanding of a highly infectious and potentially fatal disease. Uncertainties and controversies surrounded the disease and were accentuated by the various media platforms; this created a barrier to the dissemination and uptake of evidence-based health information.

The World Health Organization (WHO) declared COVID-19 a public health emergency of international concern, with the propensity to spread at an alarming rate, on January the 30<sup>th</sup> 2020; the WHO declared the disease a pandemic on March 2020.<sup>4,5</sup> The global concern and apprehension about COVID-19 stems from its highly infectious and fatality, particularly in the elderly and persons with existing morbidity.<sup>3</sup> Recommended strategies for its control include social distancing, frequent hand washing and the use of face masks;<sup>6-8</sup> however, the acceptance and practice vary from one population to the other. Until December 2020, there was no proven drug or vaccine for the prevention of COVID-19.<sup>9</sup> Good infection prevention and control measures, as stipulated by WHO and the Nigeria Centre for Disease Control (NCDC), were the only options available for the containment of this pandemic.<sup>7,10</sup> Similarly, there is no clinically approved drug for the treatment of COVID-19, though many drugs are still in the investigational process, and dexamethasone has been shown to improve the survival in COVID-19 cases.<sup>11</sup>

Interestingly, during the height of the pandemic there was a proliferation of largely inconsistent and unconfirmed information on COVID-19 in the media and other platforms. The recommended website for updates on COVID-19 is the WHO and Centre for Disease Prevention and Control (CDC) websites;<sup>7,9</sup>

however not all individuals, particularly in low-resource settings, have access to the internet, and therefore obtain information from a mix of reliable and unreliable sources. The access to valid and verifiable information regarding COVID-19 is paramount for preventing and managing the disease, but may be influenced by the socio-economic, cultural and developmental status of a community; and the income, and educational status of individuals amongst other factors. The knowledge, perception and beliefs of people are key to the prevention and control of disease pandemics such as COVID-19. Low awareness and poor perception are barriers to early detection and prevention of the spreading of the disease.<sup>12</sup> The perceptions of people about this disease so far vary. Prior to the WHO declaration of COVID-19 as a public health emergency, Nigerians displayed a nonchalant attitude towards the disease, with the mindset that it was a disease of the elite.<sup>13</sup> Some felt the relatively high temperature in the tropical regions was not conducive for the survival of the pathogen, so they considered it not a black man's disease.<sup>14</sup> Furthermore, there have been several conspiracy theories put forward to explain the origin of the disease. There are claims of it being a biological weapon of destruction; other claims include its religious or prophetic origin as predicted by Nostradamus and the Simpsons, and the 5G network theory.<sup>15-18</sup>

The afore-mentioned inconsistencies regarding COVID-19 were the basis for the current community-based study, aimed at determining the knowledge of COVID-19 and its treatment, and the perception of the disease treatment adopted by people in a low-resource setting. The information here presented may be useful for planning future interventions to contain the health and social effects of disease pandemics.

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**Supplementary information** The online version of this article ([Figures/Tables](#)) contains supplementary material, which is available to authorized users.

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## MATERIALS AND METHODS

### Study design and population

This cross-sectional study was conducted in a semi-urban population of Southern Nigeria in April-June 2020. Respondents were residents of the Oghara community, in the Ethiope-West local government area of Delta State, Southern Nigeria. According to the 2016 projection by the National Population Commission, the total adult population of Oghara is 288,070.<sup>19</sup> The community accommodates the only state-owned teaching hospital, a primary health care centre and a handful of private hospitals. There are three institutions of higher learning located in the community and a significant proportion of its inhabitants are health care workers and students. The prevailing occupation is trading and commercial transportation.

### Sample size estimation and selection

The minimum sample size calculated for this study using the Cochran formula for descriptive studies was 384; and the multi-stage sampling method was used to select study participants from the five wards that make up the community: Oghara efee-one, Oghara efee-two, Oghara efee-three, Oghara eki-one and Oghara eki-two. Inclusion criteria were adults aged  $\geq 15$  years, residing in the study area, and willing to be part of the study.

### Study instruments and protocol

A semi-structured questionnaire was used to obtain socio-demographic data, psychographic information and assess knowledge of COVID-19 and its treatment. Six questions were used to determine the level of knowledge (see Table 1); knowledge was categorised as adequate (3 or more correct responses out of 6) and inadequate knowledge (<3 correct responses). The occupational level was categorised based on five-level classification as follows: I = white-collar workers, II = petty bourgeoisie, III = farm workers, IV = skilled workers, and V = non-skilled workers.<sup>12</sup>

The questionnaire and informed consent were in English but verbally translated to 'pidgin English' where required. The researcher took steps to ensure that translation did not result in a loss of meaning or misinformation.

A door-to-door survey was conducted; questionnaires were interviewer-administered for the illiterate population and self-administered for the literate population. Interviewers were trained and adhered to safety precautions by using face-masks, shields and hand sanitisers while maintaining a safe distance.

### Ethical considerations

The health research ethics committee (HREC) of Delta State University Teaching Hospital granted expedited approval for the study. The participants' right to autonomy, confidentiality, and anonymity were respected. Trained interviewers explained the study objectives and its potential benefits to participants; they were reassured of only minimal risks related to the study and written (signed or stamped) informed consent was obtained from those who were willing to participate. All completed questionnaires were coded and only accessible to the researchers.

### Data analysis

Data were analysed using the SPSS 22.0 (IBM SPSS Statistics, New York, USA). Descriptive statistics and inferential statistics were used as appropriate to analyse the data. Knowledge of COVID-19 and its treatment amongst respondents were presented as frequencies and percentages according to age, gender and other socio-demographic and psychotropic characteristics. Chi-square test or Fishers Exact test was used as appropriate to determine any relationship between participants' characteristics and their knowledge of COVID-19. The logistic regression model was used to determine independent risk factors of good COVID-19 knowledge.

## RESULTS

Only four respondents had never heard of COVID-19 at the time of this study while the majority (34.6%)

became aware in March 2020 (Figure 1). Fifty-four (14.8%) out of 364 respondents had adequate knowledge of COVID-19; 83.6% were knowledgeable about the origin of the virus, while 34.3% knew the causative organism (Table 1). Majority (70.6%) of respondents believed that COVID-19 was real, while 5.9% believed in one of several conspiracy theories. Figure 2 shows the conspiracy theories reported by respondents; most of the respondents who believed in conspiracy theories believed SARS-CoV-2 was engineered by China.

Regarding prevention of COVID-19, 68.9% of the respondents reported that citrus fruits or spices (garlic and ginger) were recommended; 46.1% reported that infection safety measures were preventive, 29.9% reported local herbs (neem leaf, bitter leaf), and 13.7% reported chloroquine. Concerning drug treatment for COVID-19, 55.5% and 20.9% of respondents reported chloroquine and hydroxychloroquine respectively; only 17% of respondents answered 'none of the above'. Non-drug remedies reported to cure COVID-19 included citrus fruits (43.6%), garlic/ginger (41.8%), and bitter leaf (11%); only 17.6% answered 'none' (Table 1). The respondents' main sources of information included television (30.5%), social media (25.8%), internet (14.8%), friends (12.1%), radio (9.1%), health personnel (7.4%), and training sessions (0.3%).

Table 2 shows the association of socio-demographic characteristics and timeliness of COVID-19 awareness. A higher proportion of females (40%) compared to males (27.8%) became aware of the virus in March 2020. As of February 2020, only 44.4% and 16.7% of those  $\leq 20$  years and 51-60 years age group respectively had learnt of COVID-19, compared to 71.3% and 76.7% of those in the 31-40 years and 41-50 years age group respectively. Concerning occupational class, only 14.3% of those in class I were unaware of the disease, compared to other classes (class II-32%, class III-43.6%, class IV-37.1%, class V-37.5%). Only 12.5% of persons earning  $>N2,400,000$  compared to 43% of those earning  $<N600,000$  were unaware of the virus at the time of the study. At the time of the study, 12% of persons with primary level of education and less were unaware of the disease compared to 1% and

0% among those with secondary and tertiary level of education respectively.

Results of within-group comparisons showed that belief in conspiracy theory was highest amongst persons with the highest annual income (37.5%) compared to 5.1% of those earning the lowest ( $p=0.012$ ). A higher proportion of those in occupational class I (19%) compared to other lower classes believed in conspiracy theories ( $p=0.141$ ) (see Table 3).

Occupational level and educational status were significantly associated with knowledge of COVID-19 and its treatment. Among the respondents, 38.1% in occupational level I compared to 16.4% in level V had adequate knowledge ( $p=0.004$ ). Similarly, 18.8% of persons with tertiary level of education compared to 4% of those with primary or less education had adequate knowledge ( $p=0.011$ ) (see Table 4). The multivariate logistic regression model showed that males had 68% lesser odds of having adequate knowledge compared to females ( $p=0.008$ ). Participants in occupational class I had a four-fold greater odds of having adequate knowledge compared to those in class V ( $p=0.019$ ), while those in occupational class III had 79% lesser odds compared to those in class V ( $p=0.046$ ) (see Table 5).

## DISCUSSION

This community-based study aimed to determine the factors influencing participants' knowledge and perception of COVID-19 and its treatment options in a semi-urban population. In this study, knowledge about COVID-19 was inadequate (14.8%). Higher occupational class and educational attainment were significantly correlated with adequate knowledge, while male gender and occupational class were independent predictors of knowledge.

### Awareness of COVID-19

The majority of respondents learned about the disease in March 2020, which was not unexpected given that the disease was first reported in Nigeria during the last week of February, just a few days before March. More than three-fifths of respondents

believed that COVID-19 is real, according to our study. These results suggest that the government's efforts to educate the public about the disease are successful. The younger age group became aware of COVID-19 before the older age group, possibly because the younger age group is more familiar with the internet than the older age group. Studies indicate that younger age groups are more adept at using social media than older age groups and are more likely to acquire new information quickly.

### Knowlegde of COVID-19

Only 14.8% had a sufficient understanding of COVID-19. Compared to a binational comparative study conducted in Africa, which found a prevalence of 61.6%, this figure is low.<sup>1</sup> In our study, 65.93% of respondents had tertiary education, whereas in the comparative study, 84.9% of respondents had tertiary education. This difference may have accounted for the varying rate of COVID-19 knowledge, such that the higher the education level, the greater the rate of adequate knowledge among the population. In line with the same logic, an Egyptian study found that inadequate knowledge was associated with low education (OR=2.69, 95% CI:1.96-3.04).<sup>5</sup>

Notably, in contrast to the current study, the comparative study was conducted online, indicating that the majority of the participants were educated and literate enough to use the internet facility and online platforms. Malaysia (80.5%), Iraq (77.85%), and Nigeria (80%) were also found to have higher COVID-19 knowledge rates in other studies.<sup>4</sup> This could be due to differences in the educational level of participants and the population studied (urban or rural). Access to information and education institutions are indicators of urbanization, and a higher educational status is associated with greater access, better comprehension, and comprehension of information.

### Knowledge of COVID-19 treatment and prevention

Less than half of the respondents in this study (46.1%) knew or could provide COVID-19 health prevention information. Only 17% of respondents selected the "none" option for COVID-19 prevention or treatment. This finding is consistent with another

study on the COVID-19 pandemic in Africa, in which only 18% of respondents reported that there was no drug treatment for COVID-19.<sup>15</sup> Over three-fifths of respondents (68.9%) recommended citrus fruits and spices (garlic and ginger) for COVID-19 prevention. Local and international studies have produced comparable results (regarding the use of fruits and spices).<sup>12,13</sup> According to a study conducted among Egyptian adults, 33.1% recommended eating garlic to prevent the spread of the disease.<sup>12</sup> The acceptance of fruits, spices, and some herbal products for the prevention and treatment of COVID-19 may be attributable to a number of factors, such as the media's claims regarding the efficacy of these remedies, the lack of a valid and approved drug, and the high infectivity and fatality rates reported by various media outlets.

The two most recommended drugs for the treatment of COVID-19 were chloroquine (55%) and hydroxychloroquine (20%), according to survey respondents. Implementing such recommendations could explain the price increase and shortage of these medications for those who truly required them. In addition, there are concerns regarding the adverse effects of hydroxychloroquine, particularly its cardiotoxicity. Importantly, at the time this study was conducted, there were no scientifically validated treatments for COVID-19.

### Determinants of adequate COVID-19 and treatment knowledge

Our research revealed no statistically significant difference in COVID-19 knowledge between those younger than 40 (14.8%) and those older than 40 (15.0%). In contrast, a study conducted online in Egypt revealed that respondents between the ages of 19 and 35 had extensive knowledge of the disease.<sup>5</sup> The reason for the discrepancy between the two studies is unclear; however, in the current study, although the majority of respondents (89%) were under 40 years old, this does not imply access to information, as internet access is frequently restricted due to high cost and location of study (semi-urban). It was observed that responses to technical questions, such as the organism that causes COVID, its treatment, and its prevention, were typically inadequate.

In our study, approximately one-third (34.3%) correctly identified COVID's causative organism as a virus, whereas in the Egyptian study, all participants (100%) were aware of this fact.<sup>5</sup>

This study revealed that respondents with higher educational and occupational levels were more likely to be aware of COVID-19 than respondents with lower levels. Education attainment frequently determines socioeconomic status, which may explain why people with higher socioeconomic status were more knowledgeable; such individuals may also be more receptive to accessing high-quality health information. Unsurprisingly, occupational level was a predictor of adequate knowledge on its own (four-fold greater odds in level I compared to level V). Those in occupational class III (farm workers) had a statistically insignificantly lower likelihood of having adequate knowledge compared to those in level V; the reason for this is unknown, but it may be related to the busy and secluded nature of farming jobs, which may have a negative impact on information-seeking behavior.

The WHO and NCDC (in Nigeria) databases are recommended to access valid and verified information on COVID-19; the television, press, and social media have also played a crucial role in disseminating information. This population's lack of knowledge may be attributable to obstacles in gaining access to electricity and the internet, which are common in areas with limited resources, or a lack of interest. Access to accurate information is crucial for disease prevention and management. Furthermore, disease-specific health literacy helps prevent stigmatization. Males had surprisingly lower odds of having adequate knowledge compared to females. It is unclear why this observation was made.

### **The belief in conspiracies**

In this study, the most prevalent conspiracy theory associated with COVID-19 was that it was a disease created by China (7 out of 21 respondents). We deem this theory significant because it could lead to stigmatization and stereotyping of people of Chinese descent or those who have visited China. Compared to a study conducted in Poland, in which 43 to

56 percent of respondents believed in at least one conspiracy theory, the proportion of respondents in our study (5.7%) who held at least one such belief was low.<sup>12</sup> This distinction may be attributable to the study settings, which were semi-urban in our study and urban in the Poland study. It has been discovered that conspiracy theories are prevalent among people with a high level of education, a characteristic of urban settings due to the availability of vast amounts of information.<sup>12</sup> According to a study conducted among university students in Jordan, conspiracy theories are more prevalent among those with less knowledge.<sup>17</sup> In the current study, the sociodemographic variables associated with greater acceptance of conspiracy theories were age 41 to 60 years, a high occupational category (class 1), a high educational level, and a high income. People who believe in conspiracies have also cited the frightening nature of the health problem's statistics and the absence of scientific explanations, both of which are consistent with the findings of the COVID-19 outbreak.<sup>13</sup>

### **Examine strengths and weaknesses**

This was a reasonably large population community-based study conducted in a low-resource setting during the first wave of the COVID-19 pandemic to assess knowledge of the disease and its treatment.

The study's limitations include the skewed distribution toward the younger population, although this reflects the demographics of Nigeria's population; secondly, the questionnaire used in this study, although structured for the purpose, is not validated and may have led to an overestimation or underestimation of the true level of knowledge regarding COVID-19.

## **CONCLUSIONS**

In this study, inadequate knowledge of COVID-19 was associated with a higher socioeconomic class. The majority of respondents believed that COVID-19 existed. A small proportion of respondents believed in COVID-19 conspiracy theories, and this was significantly more prevalent among respondents with higher incomes than those with lower incomes.

The findings of this study should inform interventions tailored to the requirements of populations with similar characteristics. Efforts to improve electricity supply and Internet access, especially in underserved areas, should have a positive impact on the dissemination of health information.

## INFORMATION

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**Authors' contributions.** MN: design of the work, interpretation of data and drafting manuscript, OO: study conception, analysis and interpretation of data and drafting of the manuscript, FA: drafting of manuscript, JO study conception, critically revised the draft.

**Conflict of interest.** The authors declare no potential conflict of interest.

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**Availability of data and materials.** All data generated or analyzed during this study are included in this published article.

**Ethical approval and informed consent.** The Delta State University Teaching Hospital's health research ethics committee (HREC) granted expedited approval for the study. Respect was shown for the participants' right to autonomy, confidentiality, and anonymity. Participants were informed of the objectives of the study and its potential benefits; they were reassured that the risks associated with the study were minimal; and written (signed or stamped) informed consent was obtained from those willing to participate. All completed surveys were encoded and were only accessible to researchers.

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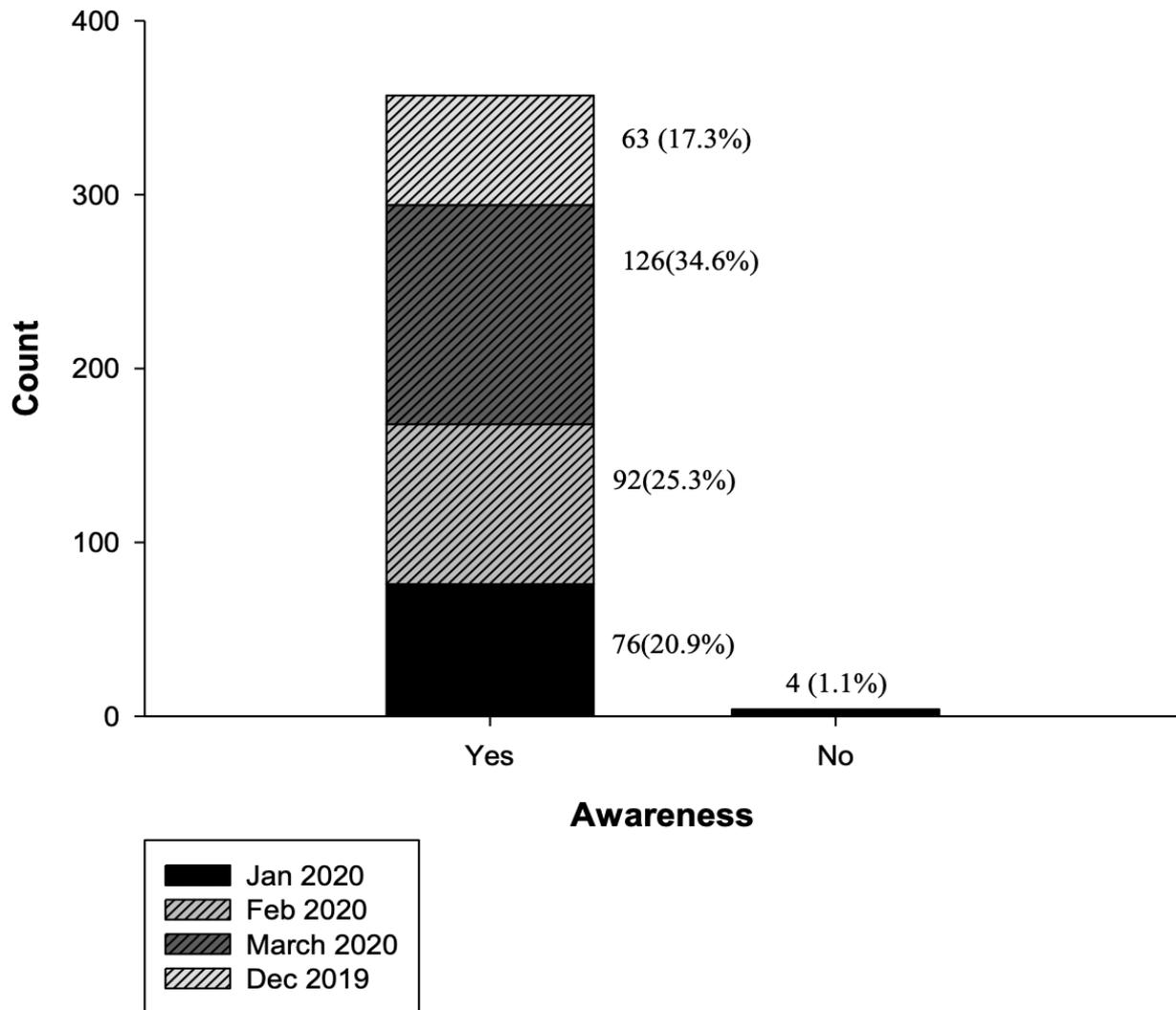


FIGURE 1: Time of initial COVID-19 knowledge.

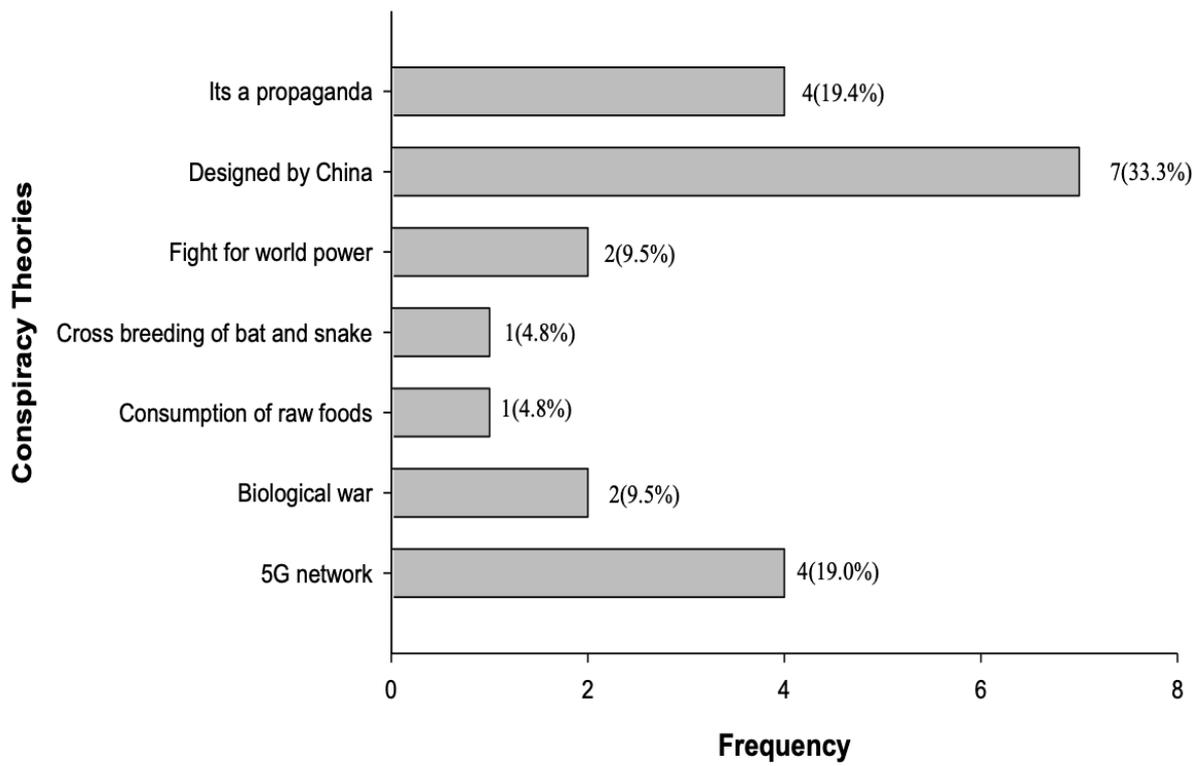


FIGURE 2: Conspiracy theories accepted by respondents.

**TABLE 1:** Respondents' Knowledge of COVID-19 and its treatment.

<b>When was COVID first reported?</b>	<b>n (%)</b>
Correct response	63 (17.8)
Wrong response	291 (82.2)
<b>Which country first reported a case?</b>	
Nigeria	2 (0.5)
USA	5 (1.4)
UK	4 (1.1)
China	313 (86.0)
Italy	10 (2.7)
I don't know	28 (7.7)
<b>Which is the microbial cause of COVID-19?</b>	
MERS-COV	10 (2.7)
SARS-COV	50 (13.7)
ZIKA Virus	13 (3.6)
SARS COV2	30 (8.2)
I don't know	239 (65.7)
<b>What is the recommended treatment of COVID 19?*</b>	
Chloroquine	202 (55.5)
Hydroxychloroquine	76 (20.9)
Remdesivir	9 (2.5)
Interferon-alpha 2b	5 (1.4)
Zinc	33 (9.1)
Azithromycin	37 (10.2)
Others (lime, vitamin C)	2 (0.5)
None of the above	62 (17.0)
<b>What is the recommended prevention of COVID 19?*</b>	
Infection safety protocols	168 (46.1)
Chloroquine	50 (13.7)
Local herbs	109 (29.9)
Citrus fruits and spices (garlic, ginger)	251 (68.9)
None of the above	59 (16.2)
<b>What natural remedy do you believe can cure or treat COVID-19?*</b>	
Spices (garlic, ginger)	152 (41.8)
Lemon	109 (29.9)
Lime	50 (13.7)
Bitter leaf	40 (11.0)
Hot water or tea	32 (8.8)
Madagascar's COVID-Organic Herbal	1 (0.3)
Roots and herbs	6 (1.6)
None	64 (17.6)

\* multiple responses

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**TABLE 2:** Association of socio-demographic characteristics and timeliness of COVID-19 awareness.

Variable	Dec 2019	Jan 2020	Feb 2020	March 2020	Never heard	Total	p
<b>Sex</b>							
Male	28 (17.3)	43 (26.5)	44 (27.2)	45 (27.8)	2 (1.2)	162 (100)	0.065
Female	35 (17.6)	33 (16.6)	48 (24.1)	81 (40.7)	2 (1.0)	199 (100)	
<b>Age category (years)</b>							
≤20	2 (7.4)	8 (29.6)	2 (7.4)	15 (55.6)	0 (0)	27 (100)	0.026*
21-30	34 (19.0)	34 (19)	42 (23.5)	68 (38.0)	1 (0.6)	179 (100)	
31-40	16 (13.9)	25 (21.7)	41 (35.7)	30 (26.1)	3 (2.6)	115 (100)	
41-50	9 (30.0)	8 (26.7)	6 (20.0)	7 (23.3)	0 (0)	30 (100)	
51-60	1 (16.7)	0 (0)	0 (0)	5 (83.3)	0 (0)	6 (100)	
61-70	1 (25.0)	1 (25)	1 (25)	1 (25.0)	0 (0)	4 (100)	
<b>*Occupatic level</b>							
Class I	10 (47.6)	6 (28.6)	2 (9.5)	3 (14.3)	0 (0)	21 (100)	0.001*
Class II	11 (22)	7 (14)	16 (32)	16 (32)	0 (0)	50 (100)	
Class III	3 (5.5)	5 (9.1)	22 (40)	24 (43.6)	1 (1.8)	55 (100)	
Class IV	10 (16.1)	11 (17.7)	16 (25.8)	23 (37.1)	2 (3.2)	62 (100)	
Class V	10 (13.9)	20(27.8)	15 (20.8)	27 (37.5)	0 (0)	72 (100)	
<b>Education level</b>							
Tertiary	53(22.3)	49(20.6)	48(20.2)	88 (37.0)	0 (0)	238 (100)	<0.0001*
Secondary	5(5.1)	24(24.5)	36(36.7)	32 (32.7)	1 (1.0)	98 (100)	
≤ Primary	10(40.0)	3(12.0)	8(32.0)	6 (24.0)	3 (12.0)	25 (100)	
<b>Annual income</b>							
<N600000	23(10.7)	38(17.8)	57(26.6)	92 (43.0)	4(1.9)	214(100)	<0.0001*
>N600000-1200000	11(28.2)	11(28.2)	10(25.6)	7(17.9)	0(0)	39(100)	
>N1200000-2400000	3(37.5%)	0(0)	4(50)	1(12.5)	0(0)	8(100)	
>N2400000	5(62.5%)	2(25)	0(0.0)	1(12.5)	0(0)	8(100)	

Occupational level: I = white-collar workers, II = petty bourgeoisie, III = farm workers, IV = skilled workers, and V = non-skilled workers.

**TABLE 3:** Acceptance of conspiracy theories according to socio-demographic characteristics of respondents.

	No,n=343 n (%)	Yes n=21	Total n=364	p value
<b>Sex</b>				
Male	153 (93.9)	10 (6.1)	163 (100)	0.824
Female	190 (94.5)	11 (5.5)	201 (100)	
<b>Age category</b>				
≤20	26 (96.3)	1 (3.7)	27 (100)	0.053
21-30	176 (96.7)	6 (3.3)	182 (100)	
31-40	107 (93.0)	8 (7.0)	115 (100)	
41-50	25 (83.3)	5 (16.7)	30 (100)	
51-60	5 (83.3)	1 (16.7)	6 (100)	
61-70	4 (100)	0 (0)	4 (100)	
<b>Occupational level*</b>				
Class I	17 (81)	4 (19)	21 (100)	0.141
Class II	45 (90)	5 (10)	50 (100)	
Class III	49 (89.1%)	6 (10.9)	55 (100)	
Class IV	60 (96.8%)	2 (3.2)	62 (100)	
Class V	69 (94.5%)	4 (5.5)	73 (100)	
<b>Educational level</b>				
Tertiary	220 (92.1)	19 (7.9)	239 (100)	0.178
Secondary	97 (98.0)	2 (2.0)	99 (100)	
≤Primary	26 (100)	0 (0)	26 (100)	
<b>Annual Income</b>				
≤N600000	205 (94.9)	11 (5.1)	216 (100)	0.012*
>N600000-1200000	36 (92.3)	3 (7.7)	39 (100)	
>N1200000-2400000	7 (87.5)	1 (12.5)	8 (100)	
>N2400000	5 (62.5)	3 (37.5)	8 (100)	

*Occupational level: I = white-collar workers, II = petty bourgeoisie, III = farm workers, IV = skilled workers, and V = non-skilled workers.*

**TABLE 4:** Association between sociodemographic characteristics and COVID-19 knowledge.

	Adequate,n (%)	Inadequate	Total	p value
<b>Sex</b>				
Male	21 (12.9)	142 (87.1)	163 (100)	0.376
Female	33 (16.4)	168 (83.6)	201 (100)	
	54 (14.8)	310 (85.2)	364 (100)	
<b>Age groups</b>				
≤40	48 (14.8)	276 (85.2)	324 (100)	1.000
>40	6 (15.0)	34 (85.0)	40 (100)	
	54 (14.8)	310 (85.2)	364 (100)	
<b>Occupational level</b>				
Class I	8 (38.1)	13 (61.9)	21 (100)	0.004*
Class II	7 (14.0)	43 (86)	50 (100)	
Class III	2 (3.6)	53 (96.4)	55 (100)	
Class IV	7 (11.3)	55 (88.7)	62 (100)	
Class V	12 (16.4)	61 (83.6)	73 (100)	
	36 (13.8)	225 (86.2)	261 (100)	
<b>Educational level</b>				
Tertiary	45 (18.8)	194 (81.2)	239 (100)	0.011*
Secondary	8 (8.1)	91 (91.9)	99 (100)	
Others	1 (4.1)	24 (96.0)	25 (100)	
	54 (14.9)	309 (85.1)	363 (100)	
<b>Annual income</b>				
≤N600000	27 (12.5)	189 (87.5)	216 (100)	0.822
>N600000	8 (14.5)	47 (84.5)	55 (100)	
	35 (12.9)	236 (87.1)	271 (100)	

*Occupational level: I = white-collar workers, II = petty bourgeoisie, III = farm workers, IV = skilled workers, and V = non-skilled workers.*

**TABLE 5:** Logistic regression model for predictors of adequate knowledge.

Variable	Univariate OR (95%CI)	P value	Multivariate OR (95%CI)	P value
<b>Sex</b>				
Male	0.75 (0.41- 1.36)	0.347	0.32 (0.14-0.74)	0.008*
Female (Ref)				
<b>Age</b>				
≤40	0.98 (0.39 -2.47)	0.975	0.84 (0.29-2.45)	0.751
>40 (Ref)				
<b>Occupational level</b>				
Class I	3.13 (1.06-9.17)	0.038*	4.11 (1.26-13.36)	0.019*
Class II	0.83 (0.30-2.27)	0.713	0.82 (0.29-2.32)	0.709
Class III	0.19 (0.04-0.89)	0.036*	0.21 (0.04-0.97)	0.046*
Class IV	0.65 (0.24-1.76)	0.394	0.72 (0.26-1.95)	0.522
Class V (Ref)				
<b>Educational level</b>				
Tertiary	5.56 (0.73-42.23)	0.097		
Secondary	2.11 (0.25-17.70)	0.491		
Others (Ref)				
<b>Income level</b>				
≤N600000	0.84 (0.36-1.97)	0.687		
>N600000 (Ref)				

Occupational level: I = white-collar workers, II = petty bourgeoisie, III = farm workers, IV = skilled workers, and V = non-skilled workers.