

Knowledge of COVID-19 and Practice of Preventive Measures among Adult Residents during the Ease of Lockdown in Nigeria

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Abstract

Background: The governments of many countries have taken steps to avert the spread of COVID 19. The gradual relaxation of the lockdown in Nigeria might be counter-productive if not properly managed. The best means to reduce and stop transmission is for the public to be adequately informed about the disease and its preventive measures. This research assessed the knowledge of COVID-19 and practice of preventive measures along with its predictors among Nigerian residents during the ease of the lockdown. **Methodology:** A cross-sectional study was conducted among 1421 adult residents of Nigeria. Data were collected between 6th and 20th September, 2020, using a semi-structured online questionnaire adapted from previous studies. IBM SPSS version 26 was used for data analysis. Pearson's Chi-square and logistic regression were used to determine the predictors of preventive practices. **Results:** The mean age of the respondents was 27.5 ± 9.1 years. A very large proportion (98.8%) of the respondents had a good knowledge of the disease (score of ≥4 out of 6 variables) and the internet (70.1%) was the major source of their information. However, only 57.6% of them had good practice of preventive measures of the disease (score of ≥3 out of 4). Predictor of good practice of preventive measure included female sex (adjusted odds ratio [AOR] = 2.626; 95% confidence interval [CI] = 2.078–3.319), being married (AOR = 2.177; 95% CI = 1.568–3.023), and possessing tertiary and postgraduate level of education (AOR = 1.813; 95% CI = 1.082–3.036 and AOR = 2.102; 95% CI = 1.206–3.664, respectively). However, residents in local government headquarters and other villages as well as towns (AOR = 0.541; 95% CI = 0.388–0.756 and AOR = 0.587; 95% CI = 0.350–0.983, respectively) have less likelihood of engaging in good practice of preventive measures. **Conclusion:** Majority of the research participants had good knowledge of the disease, while about half take part in good preventive practices measures. Predictors of the practice measures included sex, level of education, place of residence, as well as marital status. Therefore, targeted interventions should be directed to the males, those who reside outside the Federal Capital Territory and state capitals, and other high-risk groups as found by this study to reduce the risk of disease contraction during this period.

Keywords: COVID-19, knowledge, Nigeria, preventive practices

INTRODUCTION

Emerging and reemerging diseases possess a global challenge to public health.^[1] The novel coronavirus disease popularly called COVID-19 which has its origin in Wuhan city, China, has rapidly spread across most borders infecting people throughout the world. It is known to present with symptoms such as fever, dry cough, breathlessness, sore throat, recent ageusia, as well as anosmia, muscle pain, headaches, and rashes.^[2,3] In severe cases, patients may progress into acute respiratory distress, multiple-organ dysfunction which may result in death.^[2,3] Some of the infections are also asymptomatic. The disease affects all

ages. However, it has been suggested with evidence that two groups of individuals have an increased risk of getting a severe form of the disease. These include people with underlying comorbidities and the elderly.^[4] The World

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Health Organization (WHO) reiterates that everyone must protect his or her self to protect others.^[5]

COVID-19 pandemic has resulted in the mortality of thousands of humans across the globe. The infection has spread to over a hundred countries prompting the WHO to declare it a pandemic in March, 2020.^[6] As of September 4, 2020, there have been 26,121,999 confirmed cases of the disease, including 864,618 deaths worldwide.^[6,7] The first case in Nigeria was reported on February 27, 2020, and as of April 27, 2020 (two months after), there were already 1337 confirmed cases in the country with 40 deaths.^[8] As of September 5, 2020, the Nigeria Centre for Disease Control (NCDC) reported 54,905 total confirmed cases with 1054 deaths affecting all the states of the nation including Abuja, the Federal Capital Territory (FCT).^[9] The deaths included health workers, patients with underlying medical conditions, and pregnant women. However, since the first case was reported in the country, the number of infections has been increasing.

Apart from the morbidity and mortality associated with the virus, there have been serious social and economic implications on the country. To mitigate this health, social, and economic burdens, governmental and non-governmental organizations have embarked on educating the public on ways to prevent the transmission of the virus.^[10] Gatherings of fifty people and above were suspended while all civil servants below the level of an assistant director were asked to work from home.^[10,11] The presidential task force on COVID-19, in late March 2020 launched several containment plans which included shutting the national borders as well as placing the country on lockdown.^[10,12] However, there has been a gradual easing of the lockdown in Nigeria and the Federal Government on September 3, 2020, announced the third phase of the easing.^[13] International flights, amusement parks, gyms, cinemas, and event centers have now reopened, while educational institutions and the national youth service corps orientation camps are currently preparing to follow suit.^[14] If this is not properly managed, it could lead to a serious resurgence in the cases of COVID-19 in the country. The best way to reduce and stop transmission is to be adequately informed with regards to the virus, the symptoms, mode of transmission, and preventive measures.^[4]

Previous studies have reported a high level of awareness and knowledge among respondents. In the Philippines, 94% of the people have heard about COVID-19 with the main source of information being television and radio.^[15] The knowledge of the disease was high among residents of China (90%),^[3] Saudi Arabia (82%),^[16] and Malaysia (81%).^[17] Studies done among nurses and chronic disease patients in Ethiopia revealed that 74%^[18] and 66%^[19] of them had good knowledge of the disease, respectively. A value of 99.5% has been reported in Nigeria.^[20] Other studies done in the country also showed a good knowledge.^[10,21] The prevalence of preventive practices was lower than the level of knowledge in most literature. This was, however, different in Saudi Arabia where 87% of the study respondents demonstrated good preventive practices.^[16]

In Ethiopia, the prevalence of good practice was 67% and 53% among nurses and chronic disease patients, respectively.^[18,19] Handwashing was the most adopted preventive practice in the Philippines and Malaysia,^[15,17] while wearing of face mask was the most used in China.^[3] In Nigeria, improved personal hygiene was the most adopted preventive method.^[20]

Poor preventive practices with regard to COVID-19 have been associated with male gender,^[16] lower age groups,^[16] being unmarried,^[19] low educational status^[19] rural residence,^[19] low income,^[19] and poor knowledge of the disease.^[19] Wearing masks in public has been found to be associated with younger age group, male sex, lower income, and occupation.^[17] Likewise, going to crowded places has been significantly associated with the male gender, being a student, and knowledge level.^[3] Public adherence toward preventive measures of COVID-19 is usually affected by the knowledge of the disease.^[16]

This research, therefore, sought to determine the knowledge of COVID-19 and the practice of preventive measures along with its predictors among Nigeria adult residents during the ease of lockdown. There could still be a wide knowledge gap among Nigerians on COVID 19, as some believed that the disease is caused by sin,^[10] some people also believed that it is a disease of the rich and does not affect the poor. There are others who think the disease has been eliminated and is no more since the government has eased the lockdown.

METHODOLOGY

This survey adopted a cross-sectional design to assess the knowledge of COVID-19 and predictors of the practice of preventive measures among adult residents of Nigeria. Nigeria is one of the countries in Africa, located in the Western part of the continent with an inhabitant of about 200 million people. The nation is made up of people with diverse ethnicity and cultures who are united by love. The Federal Ministry of Health and its agencies such as NCDC provide and implement policies to improve the health status of the nation. This ministry along with other ministries, agencies, and partners such as WHO and UNICEF has been at the forefront in the battle against COVID-19 outbreak in the country.

The study population included adults (18 years and above) who were residing in Nigeria during the outbreak period. Data were obtained between 6th and 20th September, 2020, using a semi-structured online questionnaire that was designed using Google Form. The questionnaire was adapted from that of previous studies.^[3,17] The questionnaire assessed the respondents' sociodemographic data such as sex and age. There are six questions assessing knowledge of COVID-19 with each asking questions on different areas: etiology, symptoms, mode of spread, and control. The practice of preventive measures was assessed by four questions focusing on physical distancing and hygiene practices. The link generated from the Google Form was sent to WhatsApp, E-mails, Facebook, and other social media platforms that have residents of Nigeria as active

participants. Prospective participants were encouraged to send the links to their contacts and other online platforms. Data were collected for a period of two weeks.

The study instrument was assessed by public health experts and epidemiologists from Federal Teaching Hospital, Ido-Ekiti. It was tested for internal validity using a reliability test and Cronbach's alpha coefficient of 0.82 was gotten.

The practice of preventive measures was the dependent variable, while sociodemographic factors and COVID-19 knowledge were the independent variables. The questions regarding knowledge were six with "Yes," "No," and "I don't know" responses. A right response was assigned 1 point, while a wrong or I don't know response was assigned 0. The total score of the knowledge varied between 0 and 6. The score of 3 was set as the cumulative mean cut-off such that respondents that scored above this value were deemed to have a good knowledge, while participants who scored ≤ 3 were regarded as having poor knowledge. Similarly, each of the four questions regarding practice was scored 1 point for right practice of the preventive measure and 0 for a wrong practice. A cumulative mean cutoff was set at 2. Respondents who scored more than this were regarded as having a good practice, while those with scores of 2 and below were regarded to have poor practice.

Collected data were inputted and analyzed with statistical software IBM SPSS Statistics for Window, Version 26.0 (IBM Corp., Armonk, N.Y., USA). Frequency, percentages, mean, and standard deviation (SD) were presented in tables at univariate level of analysis. Pearson's Chi-square and logistic regression were used to determine the association between outcome and independent variables at bivariate and multivariate levels of analysis, respectively (variables were included in the regression model using a p-value cutoff of < 0.2). The level of significance was set at 5%.

Ethical approval for the study was gotten from the Human Ethics and Research Review Committee of Federal Teaching Hospital, Ido-Ekiti, Nigeria. Informed consent was taken by ticking a yes/no question.

RESULTS

Sociodemographic characteristics of respondents

A total of 1421 respondents participated in the study. The mean age of respondents was 27.5 ± 9.1 years with a 1:1.3 male-to-female ratio. Majority (82.1%) of the respondents reside in the FCT or a state capital, about three-quarter (74.7%) were never married, 72.1% had tertiary education, and more than half (53.4%) were students. The internet (70.1%) was the major source of information among the respondents. This was followed by the television (19.0%), radio (3.9%), people around (1.5%), text messages by NCDC (0.9%), and others (1.0%) [Table 1].

Knowledge of COVID-19

The mean (SD) knowledge score of COVID-19 was 5.71 (0.68) with a range of 0–6 indicating an overall correct rate of 95.17% ($5.71 \times 100/6$) for the knowledge

Table 1: Sociodemographic characteristics of respondents

Variable	Frequency (n=1421), n (%)
Age group (years)	
<40	1287 (90.5)
40-59	106 (7.5)
≥ 60	28 (2.0)
Mean age \pm SD	27.51 \pm 9.09
Sex	
Male	613 (43.1)
Female	808 (56.9)
Marital status	
Never married	1062 (74.7)
Married	333 (23.5)
Separated/divorced/widowed	26 (1.8)
Highest level of education	
Up to secondary	74 (5.2)
Tertiary	1025 (72.1)
Postgraduate	322 (22.7)
Main occupation	
Formal	338 (23.8)
Informal	199 (14.0)
Student	759 (53.4)
Unemployed/retired	125 (8.8)
Place of residence	
FCT/State capital	1167 (82.1)
LG headquarter	187 (13.2)
Other towns and villages	67 (4.7)
Main information source on COVID-19	
Internet	997 (70.1)
Television	270 (19.0)
Radio	55 (3.9)
Print media	51 (3.6)
People around	21 (1.5)
Text messages by NCDC*	13 (0.9)
Others**	14 (1.0)

*NCDC, **Health workers, religious leaders, community leaders and work place. SD: Standard deviation, FCT: Federal capital territory, LG: Local Government, COVID-19: Coronavirus disease-2019, NCDC: Nigeria Centre for Disease Control

test. Majority (98.8%; 1404) of the participants had good knowledge of the disease [Table 2].

Practice of preventive measures

Over three-quarters of the participants practice hand hygiene and hygiene of regularly touched surfaces (80.8% and 77.6%, respectively), while only about half practice physical distancing and avoidance of crowded places (54.5% and 55.0%, respectively). The mean (SD) practice of preventive measure score was 2.68 (1.28) with a range of 0–4. These suggest a practice rate of 67.0% ($2.68 \times 100/4$). It was revealed that only 818 (57.6%) participants had good practice of preventive measures of the disease [Table 3].

Predictors of practice of preventive measures

At the bivariate level, the proportion of respondents with good practice of preventive measures significantly differ across marital status ($P < 0.001$), sex of respondents ($P < 0.001$),

Table 2: Respondents' Knowledge of coronavirus disease-2019

Variable	Frequency (%)				
	Yes, n (%)	No/I don't know, n (%)			
COVID-19 is a disease caused by virus	1383 (97.3)	38 (2.7)			
Fever, dry cough, difficulty with breathing and feeling of unwell are symptoms of COVID-19	1407 (99.0)	14 (1.0)			
COVID-19 only infect the elderly	102 (7.2)	1319 (92.8)			
There is no current cure for COVID-19, but early supportive treatment can help most patients recover from the infection	1343 (94.5)	78 (5.5)			
COVID-19 spread through hugging, kissing and shaking of hands	1283 (90.3)	138 (9.7)			
Prevention of COVID-19 can be achieved with individuals avoiding crowded places	1380 (97.1)	41 (2.9)			
	Mean ±SD	Minimum	Maximum	Good knowledge, n (%)	Poor knowledge, n (%)
Knowledge score	5.71±0.68	0	6		
Overall level of knowledge of COVID-19				1404 (98.8)	17 (1.2)

Knowledge score: mean score of all respondents was 5.71±0.68. Overall level of knowledge: 98.8% scored ≥4 (good) while 1.2% scored <4 (poor). COVID-19: Coronavirus disease-2019, SD: Standard deviation

Table 3: Practice of preventive measures

Variable	Frequency (%)				
	Yes, n (%)	No, n (%)			
In the last 14 days, I wash my hand with soap and water or used alcohol-based sanitizer for at least 20 s every time I returned back home	1148 (80.8)	273 (19.2)			
In the last 14 days, I have exchanged handshakes and hugs with people	646 (45.5)	775 (54.5)			
In the last 14 days, I have gone to crowded place (s)	639 (45.0)	782 (55.0)			
I clean and disinfect regularly touched surfaces	1103 (77.6)	318 (22.4)			
	Mean ±SD	Minimum	Maximum	Good practice, n (%)	Poor practice, n (%)
Practice score	2.68±1.28	0	4		
Overall practice of preventive measures				818 (57.6)	603 (42.4)

Practice score: Mean score of all respondents was 2.68±1.28, Overall practice of preventive measures: 57.6% scored ≥3 (good) while 42.4% scored <3 (poor). SD: Standard deviation

occupation ($P = 0.002$), level of education ($P = 0.002$), and place of residence ($P = 0.003$). Regression analysis revealed that females than males (adjusted odds ratio [AOR] = 2.626; 95% confidence interval [CI] = 2.078–3.319), being married/cohabiting than being never married (AOR = 2.177; 95% CI = 1.568–3.023), and tertiary and postgraduate level of education than “up to secondary” level of education (AOR = 1.813; 95% CI = 1.082–3.036 and AOR = 2.102; 95% CI = 1.206–3.664, respectively) have significantly higher odds of engaging in good practice of preventive measures. However, residents in local government headquarters and other villages as well as towns than residence in FCT/state capitals (AOR = 0.541; 95% CI = 0.388–0.756 and AOR = 0.587; 95% CI = 0.350–0.983, respectively) has significantly lesser likelihood of engaging in good practice of preventive measures [Table 4].

DISCUSSION

COVID-19 is a new disease that carries so much impact on the various aspects of life and well-being. In Nigeria, there have been few studies carried out on the knowledge of the disease as well as its preventive practices. However, none of these studies was conducted during the ease of the lockdown.^[20,21] The fact

that COVID-19 is new and unpredictable makes it serious for health organizations and agencies to design suitable methods to manage the pandemic.^[17] This present study was done to steer this endeavour. The study, therefore, assessed knowledge of COVID-19 and practice of preventive measures along with its predictors during the ease of the lockdown.

The study had predominantly young and literate respondents with a mean age of 27.5 (±9.1) years. This age is similar to the mean age of a study done in Nigeria where most of the respondents were young people with at least a college or university degree.^[20] The reason for this may be because majority of social media platform users (which was the channel of data collection in this study) were people of younger age groups. The mean age is, however, slightly lower than the mean age reported in other online cross-sectional studies done among residents of Malaysia (34 ± 11.2 years) and China (33 ± 10.7 years) on COVID-19.^[3,17]

Majority of the respondents (98.8%) in the present study had good COVID-19 knowledge. Findings in another study done in Nigeria showed that 99.5% of the respondents have good knowledge.^[20] This is, however, higher than the results among residents of Malaysia and Northern Ethiopia where good knowledge of 80.5% and 74%, respectively,

Table 4: Predictors of practice of preventive measure (overall practice)

Variable	Overall practice of preventive measure		Bivariate analysis		Binary logistic regression			
	Good, n (%)	Poor, n (%)	χ^2	P	AOR	95% CI		P
						Lower	Upper	
Age group (years)								
<40	737 (57.3)	550 (42.7)	2.085	0.353	NA			
40-59	67 (63.2)	39 (36.8)						
≥60	14 (50.0)	14 (50.0)						
Sex								
Male	277 (45.2)	336 (54.8)	67.612	<0.001*	1.000			
Female	541 (67.0)	267 (33.0)			2.626	2.078	3.319	<0.001*
Marital status								
Never married	572 (53.9)	490 (46.1)	23.728	<0.001*	1.000			
Married/cohabiting	229 (68.8)	104 (31.2)			2.177	1.568	3.023	<0.001*
Separated/divorced/widowed	17 (65.4)	9 (34.6)			2.035	0.819	5.058	0.126
Highest level of education								
Up to secondary	29 (39.2)	45 (60.8)	12.264	0.002*	1.000			
Tertiary	591 (57.7)	434 (42.3)			1.813	1.082	3.036	0.024*
Postgraduate	198 (61.5)	124 (38.5)			2.102	1.206	3.664	0.009*
Main occupation								
Formal	218 (64.5)	120 (35.5)	14.536	0.002*	1.000			
Informal	96 (48.2)	103 (51.8)			0.833	0.562	1.236	0.364
Student	437 (57.6)	322 (42.4)			1.120	0.801	1.565	0.507
Unemployed/retired	67 (53.6)	58 (46.4)			0.886	0.561	1.397	0.602
Place of residence								
FCT/State capital	696 (59.6)	471 (40.4)	11.782	0.003*	1.000			
LG headquarter	88 (47.1)	99 (52.9)			0.541	0.388	0.756	<0.001*
Other towns and villages	34 (50.7)	33 (49.3)			0.587	0.350	0.983	0.043*
Knowledge of COVID-19								
Good	812 (57.8)	592 (42.2)	3.494	0.062	1.000			
Poor	6 (35.3)	11 (64.7)			1.042	0.413	3.739	0.700

* $P < 0.05$, χ^2 : Chi-square test. OR: Odds ratio, AOR: Adjusted OR, CI: Confidence Interval, NA: Not applicable, FCT: Federal capital territory, LG: Local Government, COVID-19: Coronavirus disease-2019

were reported.^[17,18] The proportion of participants with good COVID-19 knowledge in this study was expected, given that most of them had at least tertiary education. This high knowledge level is also good for the public. The internet was the major information source in this study (70.1%), while only a very minor proportion (0.9%) got their knowledge through the NCDC text messages. This may suggest that the internet did more in educating Nigerians than the text messages by NCDC. This is not different from results in a Malaysian study, where majority of the respondents also acquired their knowledge via the internet and social media.^[20]

Furthermore, despite the high percentage of participants with good knowledge of the disease, only 57.6% had good practice of preventive measures. While 80.8% practice good hand hygiene, only 54.5% and 55% practice physical distancing and avoidance of crowds, respectively. These findings are relatively lower than what was documented in studies done in north-central part of Nigeria (hand washing/hygiene, 96.4%; social distancing, 92.7%), Malaysia (hand hygiene, 87.8%; social distancing/avoiding crowds, 83.4%), China (avoiding crowds, 96.4%), and Philippines (hand washing, 89.9%; avoiding crowded places,

62.9%; and keeping a distance from people, 65.9%).^[3,15,17,20] The low practice of physical distancing and avoidance of crowded places may be due to the ease of the lockdown by the Nigerian government. Since the ease of the lockdown, strict implementation of preventive measures including banning of public gatherings has reduced. It is, therefore, important for the government and other regulatory bodies to step up their game during this period to avoid another wave of the pandemic in the country.

This study found sex (female), marital status (married/cohabiting), level of education (tertiary and postgraduate education), and place of residence (FCT/State capital) of respondents as the predictors of good practice of preventive measures. This is not different from the results of a research in the Kingdom of Saudi Arabia where sex and region of residents were documented as predictors to the practice of preventive measures of COVID-19.^[16] Another study from Ethiopia revealed that being unmarried, having no formal education, and living in rural areas were related to poor practice of preventive measures of COVID-19.^[19] Gender interacts with the socioeconomic, behavioural, and biological determinants of health and illness.^[22] Females in this study were found to

have good practice of preventive measures. Females have also been found to have better health-seeking behaviours.^[23] All of these suggest that males are vulnerable groups. Unfortunately, males are never seen as belonging to the vulnerable group in Africa. It is therefore important that targeted interventions should be directed toward this group of people to lessen their chances of contracting COVID-19.

The limitation of the research was that information was obtained online via social media networks. Bias may result from this, given that some groups of people may not have access to social media or such networks and thus not participate in the study. Furthermore, this study used a self-reported method for practice with a chance of recall bias. Respondents may also give socially desirable responses. A more objective way of assessment may have helped prevent these.

CONCLUSION

This research investigated COVID-19 knowledge and practice of preventive measures along with its predictors during the ease of lockdown among adult residents of Nigeria. Findings suggested a very huge proportion of Nigerians had good knowledge of the disease which did not translate into the practice of preventive measures. A large proportion of the people were still visiting crowded places and not observing physical distancing. Male sex was particularly identified as a risk group. Other predictors of practice of preventive measures in the study were marital status, level of education, and location of residence. Targeted interventions should be directed to the vulnerable groups such as males, those who reside outside the FCT and state capitals, as well as others in order to lower the increased chance of contracting the disease during this period.

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Conflicts of interest

There are no conflicts of interest.

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