



# Knowledge, Attitude and Practice of Clients towards COVID-19 at Primary Healthcare Facilities in Rivers State, Nigeria

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## Authors' contributions

This work was carried out in collaboration among all authors. Author AIW contributed in conception, design, analysis, interpretation and manuscript drafting for publication. Author CKE contributed in conception, design, interpretation and revised draft of the manuscript. Author VAK contributed on design, interpretation, and revised draft of the manuscript. All authors read and approved the final manuscript.

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## ABSTRACT

**Introduction:** In spite of all the measures introduced to fight the spread of the coronavirus (COVID-19) in Nigeria by relevant authorities, it is still ravaging the country. This calls for the commitment and responsibility of the citizens in their adherence to all the control measures and guidelines,

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whose effectiveness is dependent on their knowledge, attitudes, and practices (KAP). This study investigated the KAP of clients who attended primary healthcare facilities (PHFs) in Rivers State, Nigeria over the period 16th to 20th June 2020.

**Methods:** A cross-sectional survey was conducted involving the clients seeking care at the public primary healthcare facilities in the 23 local government areas (LGAs) of Rivers State, Nigeria as respondents. Using descriptive analysis, the results for each of the quantitative variables were presented as mean  $\pm$  standard deviation, whilst those for the categorical variables were reported as frequency and percentage. The association between the responses on KAP and demographic characteristics were tested using the Chi-square test. Binary logistic regression was performed to identify factors associated with KAP and statistical significance was assessed at  $P < 0.05$ .

**Results:** Out of 460 questionnaires distributed, 434 respondents participated in the survey, revealing a 94.3% response rate. The proportion of respondents with moderate and above scores in knowledge, attitude, and COVID-19 related practices are 86.6% (62.9+23.7), 80.6% (57.6+23.0), and 58.0% (30.8+27.2) respectively. Occupation, educational level, and senatorial districts are associated with knowledge and attitude, whilst age and senatorial districts are associated with the level of adherence to preventive practices; knowledge level also has associations with both attitude and practices towards COVID-19.

**Conclusion:** On the basis of these findings, we suggest public health education programs on COVID-19 should target individuals with low knowledge levels, lower educational attainment, and those residing in the Rivers South-East senatorial zone in the promotion of their messages on COVID-19.

*Keywords: COVID-19; KAP; clients; primary healthcare facility; Rivers State; Nigeria.*

## ABBREVIATIONS

*KAP: Knowledge, Attitudes, and Practices; LGA: Local Government Areas; NCDC: Nigeria Center for Disease Control; PHCW: Primary Health Care Workers; PHF: Primary Healthcare Facility; WHO: World Health Organisation.*

## 1. INTRODUCTION

The outbreak of coronavirus (COVID-19) has impacted the lifestyles of people all over the globe as well as the economies of virtually every country. Infection of humans by the virus was first reported in December 2019 in Wuhan, China [1], and has speedily affected more than 215 countries [2]. The World Health Organization (WHO) has since March 12, 2020, declared the disease a pandemic [3]. As of 6<sup>th</sup> July 2020, there were 11,418,475 COVID-19 cases and 533,958 deaths globally [4].

Between 27<sup>th</sup> February 2020 when the first case of the virus was reported in Lagos State, Nigeria and 6<sup>th</sup> July 2020, the number of confirmed cases in that West African country, has increased rapidly to 28,711 including 645 deaths [5,6]-making Nigeria the third highest in Africa, next to South Africa and Egypt [4]. Rivers State, one of the oil-producing States in Nigeria is considered the epicenter of the disease in the South-South

geopolitical zone and the fifth most affected State in the country with over 1,183 confirmed cases and 41 deaths. Over the period, Lagos State, the Federal Capital Territory (FCT) Abuja, Kano, and Oyo States being those with higher burden [6].

Several control measures have been introduced by both the State and Federal governments to fight the disease since its outbreak- the former through their ministries of Health and the later, through the Nigeria Center for Disease Control (NCDC) under the leadership of the Presidential Task Force (PTF) on COVID-19. These include the closing of land and sea borders, airports, and all public spaces, such as open markets and schools. In spite of all these measures, the disease is still ravaging the country. Thus, there is need for public commitment and responsibility in the fight against the disease by their adhering to all the control measures and guidelines, which according to the KAP theory are principally affected by knowledge, attitudes, and COVID-19 related practices (KAP) of the population [7,8].

To facilitate the fight against COVID-19 in Nigeria, it is imperative to assess and understand the awareness of COVID-19 by the public. Therefore, this study investigated the KAP of the clients who attended public primary healthcare facilities (PHFs) in Rivers State, Nigeria about COVID-19.

## 2. MATERIALS AND METHODS

### 2.1 Study Design and Population of the Study

A cross-sectional survey was conducted involving the clients seeking care at the public primary healthcare facilities in the 23 local government areas (LGAs) of Rivers State, Nigeria as respondents.

### 2.2 Sample Size and Sampling Techniques

We estimated a sample size of 378 to command 90% power at 5% significance level, using an online sample size calculator, but chose a study sample of 460 to allow for possible cases of non-response or invalid response. Hence, 20 copies of the questionnaires were distributed to each of the 23 LGAs. Four health facilities were selected by simple random sampling from a list of facilities in each LGA, making it a total of 92 PHFs. Similarly, we randomly selected five respondents from each of the 4 facilities, among the clients who attended the facilities on the exact day of survey.

### 2.3 Data Collection

Data for the study was collected from the PHFs across the 23 LGAs of Rivers State from 16<sup>th</sup> to 20<sup>th</sup> June 2020 using an adapted WHO questionnaire on detection, prevention, response, and control of COVID-19 [9]. The questionnaire was divided into two parts: demographics and KAP. The demographic characteristics were gender, age, marital status, occupation, educational level, and Local government area. The KAP part had 26 questions relating to knowledge, 15 relating to attitude, and 12 questions on the actual COVID-19 related practices of the respondents about COVID-19. A correct answer was assigned 1 point while an "incorrect/I don't know" was assigned 0 point. A higher score denoted a good KAP, whereas a lower score denoted a poor KAP of COVID-19. In particular,  $\geq 88\%$ , 61% - 87% and  $\leq 60\%$  denoted high, moderate and low KAP on COVID-19 respectively.

### 2.4 Statistical Analysis

Data were entered into the Statistical Package for Social Science (SPSS) version 25, while all analysis were done using both SPSS and the

STATA version 15 (Stata Corp., College Station, TX, USA) software. Using descriptive analysis, the results for each of the quantitative variables were presented as mean  $\pm$  standard deviation, whilst those for the categorical variables were reported as frequency and percentage. The association between the responses on KAP and demographic characteristics were tested using the Chi-square test. Binary logistic regression was performed to identify factors associated with KAP and statistical significance was assessed at  $P < 0.05$ .

## 3. RESULTS

A total of 434 respondents voluntarily participated in the study out of 460 questionnaires that were distributed. This showed a high response rate of 94.3%. Table 1 reveals the statistics on overall knowledge, attitude, and COVID-19 related practices in mean  $\pm$  standard deviation and percentages in three categories (low, moderate, and high). The proportions of respondents that have moderate and above scores in knowledge, attitude and COVID-19 related practices are 86.6% (62.9+23.7), 80.6% (57.6+23.0), and 58.0% (30.8+27.2) respectively. Table 2 shows that majority of the respondents are female (67.3%), aged 25 to 35 (47.7%), non-healthcare workers (67.2%), attained tertiary education (53.8%), and married (66.6%). The mean age (with standard deviation) of the respondents is 33.17  $\pm$  9.07.

Table 3 displays the clients' mean score for knowledge, attitude, and COVID-19 related practices towards COVID-19 across different groups of demographic characteristics. It shows that age was significantly associated with COVID-19 related practices ( $P=0.008$ ), but not with knowledge and attitude. Occupation, educational level, and senatorial district of respondents were also significantly associated with knowledge and attitude ( $P < 0.05$ ). Also, the knowledge level was significantly associated with both attitude and COVID-19 related practices ( $P=0.000$ ). Whereas gender and marital status were not significantly related to neither knowledge, attitude nor COVID-19 related practices; preventive practice against COVID-19 was also influenced by age and senatorial district among patients attending primary health facilities ( $P < 0.05$ ). It is worthy of note that two previous studies in Nigeria [10] and China [11] had also identified educational level as a risk factor for COVID-19 related practices.

Table 4 shows the results from the multiple logistic regression involving some demographics that have significant association with KAP as shown in Table 3. The table reveals that respondents who attained tertiary education were significantly less likely to have low knowledge of COVID-19 (OR=0.15, 95% CI= 0.04-0.55) compared to those that have no formal education and a similar association was found with attitude to COVID-19: compared with those with no formal education, people with high educational attainment were significantly less likely to have negative attitude to COVID-19- (OR=0.77, 95% CI= 0.79-0.88 for secondary and OR=0.60, 95% CI= 0.47-0.79 for tertiary). Those that reside in the Rivers South-East senatorial zone significantly exhibited a more negative attitude toward COVID-19 (OR=3.21, 95% CI= 1.63-6.35) compared to those that reside in the East. Those who have sufficient knowledge about COVID-19 were significantly less likely to have a negative

attitude than those that have insufficient knowledge- moderate (OR=0.15, 95% CI= 0.08-0.29) and high (OR=0.11, 95% CI= 0.04-0.25).

Furthermore, with regard to COVID-19 related practices, respondents that attained a tertiary level of education are less likely to have poor COVID-19 related practices and adherence to outlined guidelines (OR=0.64, 95% CI= 0.48-0.83) compared to those that have no formal education. Like attitude, residing in the Rivers South-East senatorial zone was significantly associated with poor COVID-19 related practices (OR=2.64, 95% CI= 1.46-4.79) than residing in the East. Moderate knowledge and high knowledge were significantly less likely to adopt poor COVID-19 related practices (OR=0.24, 95% CI= 0.12-0.47) and (OR=0.09, 95% CI= 0.04-0.24) respectively than those that have low knowledge towards COVID-19.

**Table 1. Number of questions, scores and level of KAP regarding COVID-19**

Levels	Number of Questions	Range of scores	Total score (Mean ±SD)	Level (%)		
				Low	Moderate	High
Knowledge	26	0-26	19.46 ± 4.17	13.4	62.9	23.7
Attitude	15	0-15	10.44 ± 2.81	19.4	57.6	23.0
Practice	12	0-12	6.24 ± 2.68	42.0	30.8	27.2

**Table 2. Distribution of clients according to their demographic characteristics**

Characteristics	Number	Percentage
<b>Gender</b>		
Male	142	32.7
Female	292	67.3
<b>Age as at last birthday</b>		
<25	71	16.5
25-35	205	47.7
>35	154	35.8
Mean ± SD	33.17 ± 9.07	
<b>Occupation</b>		
Healthcare related	137	32.8
Non-Healthcare related	281	67.2
<b>Educational level</b>		
No formal education	14	3.3
Primary	17	4.0
Secondary	166	39.0
Tertiary	229	53.8
<b>Senatorial district</b>		
Rivers east	158	36.4
Rivers-west	155	35.7
Rivers South-east	121	27.9
<b>Marital status</b>		
Not married	142	33.4
Married	283	66.6

**Table 3. Mean score of clients on the level of KAP**

Characteristics	Mean ± Standard Deviation					
	Knowledge	P-value	Attitude	P-value	Practice	P-value
<b>Gender</b>		0.187		0.809		0.231
Male	19.94±3.54		10.39±2.76		7.83±3.06	
Female	19.22 ±4.17		10.46±2.84		8.44±2.45	
<b>Age as at last birthday</b>		0.643		0.333		0.008
<25	18.97 ±5.00		10.54±3.30		7.99±3.55	
25-35	19.69 ±3.70		10.46±2.62		8.44±2.45	
>35	19.37 ±4.35		10.39±2.79		8.10±2.51	
<b>Occupation</b>		0.019		0.047		0.124
Healthcare related	20.28 ±3.55		10.83±2.43		8.69±2.34	
Non-Healthcare related	19.04 ±4.40		10.46±2.80		7.99±2.85	
<b>Educational level</b>		0.000		0.036		0.191
No formal education	16.07 ±7.66		9.00 ±3.68		8.64±3.00	
Primary	18.12 ±5.42		10.24±2.66		8.35±1.80	
Secondary	18.67 ±4.54		10.02±3.08		7.80±3.01	
Tertiary	20.43 ±4.19		10.86±2.44		8.57±2.39	
<b>Senatorial district</b>		0.000		0.000		0.000
Rivers-east	19.87 ±4.04		11.07±2.69		8.59±2.21	
Rivers-west	19.50 ±4.14		10.54±2.67		8.76±2.45	
Rivers South-east	18.78 ±4.31		9.45 ±2.88		7.15±3.21	
<b>Marital status</b>		0.520		0.502		0.197
Not married	19.76 ±3.37		10.66±2.58		8.16±2.85	
Married	19.40 ±4.31		10.37±2.85		8.32±2.58	
<b>Knowledge</b>	NA	NA		0.000		0.000
Low			7.26±3.68		5.84±3.44	
Moderate			10.72±2.29		8.43±2.46	
High			11.47±2.20		9.08±1.91	

Significant at  $P < 0.05$ 

#### 4. DISCUSSION

To the best of our knowledge, this is the first study to investigate the KAP of patients towards COVID-19 who sought care at PHFs in Nigeria, although there are studies on KAP of healthcare workers and the general population towards this disease both in Nigeria and abroad [11-14]. Like previous studies in China [13] and Iran [15], the study was dominated by the female and those who had attend tertiary education. The study found that most of the respondents were knowledgeable and had a positive attitude towards COVID-19. This is consistent with other studies in China [13] and Iran [14] but contradicts another study in Bangladeshi [15]. The possible explanation for the association between sufficient knowledge and positive attitude might be because the study population was dominated by the well-educated. However, sufficient knowledge and positive attitude among respondents did not translate to adoption of good preventive COVID-19 related practices. The finding contradicted studies on KAP of healthcare workers in Ugandan [16] and Saudi Arabia [17]. The poor

preventive practices among the clients might be attributed to the low fatality and high recovery rates of the disease in the country [6].

The study also identified some demographic factors which are associated with insufficient knowledge, negative attitude, and poor COVID-19 related practices among patients that seek care at the public primary healthcare facilities in Rivers State. Occupation, educational level, and senatorial zone were significantly associated with knowledge level, so also were occupation, educational level, senatorial zone and knowledge level significantly associated with attitude; COVID-19 related practices were significantly associated with age, senatorial zone and knowledge level. The findings of this study regarding demographic variables associated with KAP towards COVID-19 are partially comparable to those found in previous studies [14,15,18,19]. Also, our study revealed a significant association between knowledge level with attitude and COVID-19 related practices- similarly reported by an earlier study in Iran [15].

**Table 4. Logistic regression for knowledge, attribute and practice of clients towards COVID-19 in Rivers State**

Characteristics	Knowledge		Attitude		Practice	
	OR	95% CI for OR	OR	95% CI for OR	OR	95% CI for OR
<b>Age as at last birthday</b>	NA	NA	NA	NA		
<25					1.00	
25-35					1.02	0.51-2.06
>35					1.44	0.70-2.98
<b>Occupation</b>					NA	NA
Healthcare related	1.00		1.00			
Non-Healthcare related	1.59	0.70-3.57	1.48	0.79-2.78		
<b>Educational level</b>						
No formal education	1.00		1.00		1.00	
Primary	0.83	0.16-4.28	0.93	0.85-1.03	0.96	0.79-1.07
Secondary	0.45	0.13-1.63	0.77*	0.79-0.88	0.89	0.79-1.09
Tertiary	0.15*	0.04-0.55	0.60*	0.47-0.79	0.64*	0.48-0.83
<b>Senatorial district</b>						
Rivers-east	1.00		1.00		1.00	
Rivers-west	0.73	0.34-1.57	1.64	0.80-3.36	0.85	0.45-1.58
Rivers South-east	1.40	0.70-2.81	3.21*	1.63-6.35	2.64*	1.46-4.79
<b>Knowledge</b>	NA	NA				
Low			1.00		1.00	
Moderate			0.15*	0.08-0.29	0.24*	0.12-0.47
High			0.11*	0.04-0.25	0.09*	0.04-0.24

\*significant, OR-odd ratio, CI-confidence interval. NA- Not applicable

Furthermore, regarding the level of educational attainment, the findings of this study are comparable with other studies in Nigeria and abroad [10,14,15] which revealed that those who attained higher education are significantly less likely to have low knowledge, negative attitude, and poor preventive practice towards COVID-19. Our study also revealed that those residing in the Rivers South-East senatorial zone significantly had a more negative attitude and poor preventive practices toward COVID-19 compared to those that residing in the Rivers-East and Rivers-West senatorial zones. One notable possible explanation for this is insufficient public health education awareness. The risks of negative attitude and poor COVID-19 related practices were significantly less among patients who had a moderate and high level of knowledge about COVID-19 as was reported by a previous study in Iran [15].

This study was limited by the fact that most of the respondents are literate, with at least secondary education. The uneducated were not adequately represented, and that might affect the generalizability of study.

## 5. CONCLUSION

Our findings revealed that patients at public primary healthcare facilities in Rivers State, demonstrated good knowledge, positive attitudes, but unreasonable preventive practice about COVID-19. We found evidence of a number of associations between the knowledge levels of the patients and their attitude and preventive practice. On the basis of these findings, we suggest public health education programs on COVID-19 should principally be targeted at individuals with low knowledge level, lower educational attainment, and that more efforts are needed for residents of the Rivers South-East senatorial zone. We think such efforts may enhance the right attitude and the adoption of unarmful COVID-19 related practices which are necessary mitigating the impact of COVID-19 on the target population in Rivers State.

## CONSENT AND ETHICAL APPROVAL

The study was approved by the Rivers State Health Research Ethics Committee

(RSHMB/RSHREC/11.20/VOL.8/063). The questionnaire was administered with strict adherence to the standard instructions on physical distancing, wearing of face masks and hand gloves, and with the written consent of the respondents.

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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