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**Original Research Article**

# Epidemiological survey of knowledge, attitudes and practices: a preventive intervention strategy against COVID-19 pandemic in Nigeria

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## ABSTRACT

**Background**: This study assessed how intervention strategy influenced the attitudes of the Nigerian public and their practices to cause a behavioural change at the peak of the COVID-19 pandemic. An epidemiological survey designed as a cross-sectional descriptive study, was conducted at the height of COVID-19 pandemic in Nigeria to assess the knowledge, attitudes, and practices (KAP) of Nigerians as a preventive intervention strategy against the novel Coronavirus. A self-structured questionnaire was designed specifically for this study. The study objectives were assessed on a three point scale of "maybe, no and yes."
**Method:** Online questionnaires were randomly administered to the general Nigerian public. The online survey used Google form and the study was limited to Nigerian residents with access to internet. The questionnaire was sectioned into two parts. The first part captured social demographics and the second part included five items each assessing public KAP towards the COVID-19 pandemic.
**Results:** Three hundred and forty-seven (347) persons responded to the questionnaires. All respondents (100%) demonstrated adequate knowledge of COVID-19. Reports on attitude towards COVID-19 showed that 287 (82.7%) of the respondents were critical about COVID-19 information while 323 (93.0%) adhered to guidelines about COVID-19 indicating good practice.
**Conclusions:** This study reveals a good knowledge of COVID-19, right attitudes and appropriate safe practices towards COVID-19 in Nigeria, consequently, good adherence and compliance to the guidelines. However, the few respondents with poor understanding and attitudes presents a cause for concern.

**Keywords:** Epidemiological survey, KAP, Preventive intervention strategy, COVID-19, Nigeria

## INTRODUCTION

A remarkable event of the year 2019 was the emergence of the novel Coronavirus. First noticed to be a pneumonia-like infection on December 12, 2019 in Wuhan, China, the virus was later confirmed to be of the subfamily *Orthocoronavirinae* and then named 2019-nCoV and later COVID-19 virus.[1-3] The decade 2020 thus, began on a panic note globally on the account of its continued effects; increasing morbidity and mortality.

Declared a pandemic by the world health organisation (WHO) in early 2020, it became more worrisome with Nigeria identified as a high-risk country for the spread of the virus from China.[4] With the advent of the pandemic, there has continued to be information dissemination regarding the cause, risk factors, transmission, signs and symptoms as well as preventive intervention strategies. The strain is novel, with no known cure, making preventive measures including regular hygiene, social distancing, imminent. Further, the need for continued public enlightenment became high to ensure improved awareness or knowledge of the public about the novel Coronavirus. The aim of bridging this knowledge gap was to ensure the populace display right attitudes throughout the period as well as imbibe good practices while debriefing them of frivolous myths flying around.

Preventive intervention is vital in public health and epidemiology. Aware of the undisputed fact that "prevention is better than cure", preventive intervention remains the key to many novel public health issues including COVID-19.[5] This approach helps in reducing risk exposure by altering behaviours or exposures that can lead to disease or by enhancing resistance to the effects of exposure to a disease agent.[5] Since the inception of the COVID-19 pandemic, many approaches have been adopted to curtail the spread of the novel Coronavirus due to its devastating effect. As expected, African nations have focused more on preventive strategies, especially considering weak health systems that could hinder case management. In view of the poor healthcare system in Africa, and the mortality recorded in Italy, America and other countries with better healthcare facilities, the predicted effect on Africa may be better imagined than said, but quite grave.[6] As such with, infection prevention and control approach has been the tool in-use in the area of this study. Notably, the observance of the guidelines as published hugely relies on the extent of exposure of the residents to the information about COVID-19 otherwise referred to as intervention.[7] The role of knowledge and awareness in disease prevention and control cannot be overstressed. Nonchalant attitudes and adoption of myths by public as a result of lack or minimal knowledge remain a challenge to proper public health practices. Good knowledge about the novel coronavirus may possibly be an indication of the public health echoes and the successful circulation of information about the novel Coronavirus disease.

Furthermore, proper knowledge may possibly influence the attitude, which will in-turn affect practices. Therefore, studies like this one; are imperative to evaluate the effectiveness of the public health campaigns and the effort of the government as well as to measure individual concerns about the fight against the novel Coronavirus. Besides, performing this study during the crisis is key to assess situational reports to determine the effectiveness of the implemented policy on COVID-19. Also, to understand if safety measures and information disseminated about COVID-19 pandemic by relevant bodies such as WHO and Nigeria centre for disease control are meaningful and well understood by the populace as well as the attitudes plus practices put up in response to pandemic. Obviously, the role of KAP in public health, particularly during outbreaks and pandemic period cannot be overemphasised.

Decisively, within the scope of this epidemiological study, preventive intervention strategies focused on exposure of study participants to information about COVID-19, including its practical application. This exposure was considered to be a form of intervention in this study. Thus, the study assessed how this intervention influenced the attitudes of the research population and their practices to cause a behavioural change during the peak of the COVID-19 pandemic. It is our hope that the outcome of this study shall serve as feedback on the novel Coronavirus from the public perspective.

## METHODS

### *Ethics and study design*

The study was conducted in accordance with the provisions of ethical consideration as provided for by the Helsinki declaration. The epidemiological survey followed a cross-sectional descriptive pattern and was conducted at the peak of COVID-19 pandemic in Nigeria, from May to August, 2020, to assess the KAP of the public towards the novel Coronavirus.[8] KAP studies have been proven to be instrumental in public health, especially as it pertain prevention and case management.[9] KAP studies aid the populace to make informed decisions about their health. Within the scope of this study, KAP was used as a preventive intervention tool to assess behavioural modification of Nigerians since the inception of the COVID-19 pandemic.

The online survey used Google form and the study was limited to residents of Nigeria who had access to the internet as at the time of study. The main instrument used in the study was a self-structured questionnaire designed specifically for this study. The questionnaire was sectioned into two parts first part captured social demographics and the second part included five items assessing public knowledge, attitudes and practices towards the COVID-19 pandemic. In addition, the questionnaire included three items assessing the study objectives on a three point scale of "maybe, no and yes." Experts validated the questionnaire through content and face validity approaches. Efforts were made to reach as many people as possible, though the response was low. Challenges relating to sample size have been discussed in the limitations of the study.

### *Limitations of study*

The generalisation of this study should be done with caution because the sample size is not a true representation of the country's population. Also, the

study is not completely free from bias since the study was self-reported; respondents may have provided a socially desirable response. Besides, this cross-sectional study only gives peripheral picture and the possible variation in KAP abound as disease advances. Therefore, continuous assessment is needed at varying times to evaluate epidemiology of perceptions being studied. Moreover, this study used a web-based data collection technique for collecting responses. Although, method enhanced large coverage considering mass geographic distribution of Nigeria, rapid responses were achieved within the short possible time but it was only applied to internet users.

### *Statistics*

A 0.93 reliability coefficient was the reliability index obtained using Cronbach alpha. Both primary and secondary data were used. Gpower version 3.1.9.2 was used for sample size calculation. A response rate of 99.1% representing three hundred and forty-seven (347) respondents was achieved through simple random sampling. This is based on the fact that, respondents had equal chances of selection without bias. Further statistical analysis was conducted using SPSS version 21 for frequency and percentage distribution of the responses.

## RESULTS

This study assessed knowledge, attitude, and practices of Nigerians on the COVID-19 pandemic. These shared experiences were extracts from 347 respondents, all residents in Nigeria as at the peak of the pandemic, which was marked with a progressing heightened curve in the country. The survey showed a response rate of 99.1%. Gender stratification revealed 59% female and 41% males with greater percentage of respondents being literate, as 89% while 11% were illiterates.

Our study investigated knowledge of the respondents about COVID-19 during the heat of the pandemic in Nigeria, the outcome of the study demonstrated good knowledge of the residents evident in the responses obtained. The five items of the questionnaire, which explored the knowledge construct revealed the following; all study participants were aware (100%) of COVID-19. Although 280 (80.7%) disagreed that COVID-19 infection was based on socio-economic status, 67 (19.3%) linked the novel Coronavirus to socio-economic status. With respect to cause, a greater number 326 (87.0%) correctly stated that Severe Acute Respiratory Syndrome Coronavirus is the causative agent of COVID-19. However, a small number of respondents 45 (13.0%) disagreed. Further query which pertains transmissibility revealed that, an excellent number of respondents 326 (94.0%) rightly put forward that the novel Coronavirus can be transmitted nevertheless, lesser number of individual were uncertain 21 (6.1%), while none, 0 (0.0%), bluntly disagreed. To add to it, 282 (81.3%) accepted as true the presence of COVID-19 in Nigeria but 14 (4.0%) were undecided. Surprisingly, some residents 14 (4.0%) still did not believe in the existence of COVID-19 in Nigeria (Table 1).

**Table 1: Frequency distribution of response about knowledge of COVID-19, (n=347).**

| Knowledge of COVID-19 | Maybe, N (%) | No, N (%) | Yes, N (%) |
|---|---|---|---|
| **Aware of COVID-19** | 0 (0) | 0 (0) | 347 (100) |
| **COVID-19 infection is based on socio-economic status** | 0 (0) | 280 (80.7) | 67 (19.3) |
| **Severe acute respiratory syndrome coronavirus is the causative agent of COVID-19** | 0 (0) | 45 (13) | 326 (87) |
| **COVID-19 is transmissible** | 21 (6.1) | 0 (0) | 326 (94) |
| **COVID-19 is in Nigeria** | 51 (14.7) | 14 (4) | 282 (81.3) |

The study objectively examined the attitudes of people towards COVID-19 as shown on table 2. The respondents showed an indication of appropriate attitudes as surveyed in this study. Specifically, most respondents 287 (82.7%) were critical about COVID-19 information nonetheless, 60 (17.3%) had contrary views. Good number 298 (85.9%) perceived that people are dying of Coronavirus but they remained optimistic. Divergently, 12 (3.5%) opposed that view while 36 (10.7%) were unsure.

Further scrutiny suggests that some respondents 139 (40.0%) felt that Government restrictions were more dangerous than the virus, whereas some respondents 132 (38.0%) varied in the perception about the laws on restriction and by implication disagreed, while 76 (22.0%) had unresolved opinions. Also, greater number of participants 293 (84.4%) perceived that the safe practices of good hand hygiene were apt and very hopeful. However, 15 (4.4%) respondents disregarded that in their views while 39 (11.2%) respondents were uncertain. Besides, the report of the availability of personal protective material confirms right attitudes of the residents as revealed in this study. Of the respondents, 292 (84.2%) affirmed “protective material available for my personal use” while 49 (14.2%) had ‘no” as a response and 6 (1.6%) were undecided.

The last objective of this study specifically addressed practices bothering on COVID-19 prevention. The study focused on two basic preventive practices categorised as safe (best) and unsafe (crude) practices. The report of the responses on safe (best) practices established good adherence and compliance to the COVID-19 guideline as stipulated by the world health organisation and Nigeria centre for disease control.

**Table 2: Frequency distribution of respondents' attitude towards COVID-19, (n=347).**

| Attitude towards COVID-19 | Maybe, N (%) | No, N (%) | Yes, N (%) |
|---|---|---|---|
| **Critical about COVID-19 information** | 0 (0) | 60 (17.3) | 287 (82.7) |
| **Perceived people are dying of Coronavirus but optimistic** | 36 (10.7) | 12 (3.5) | 298 (85.9) |
| **Government restrictions are more dangerous than the virus** | 76 (22) | 132 (38) | 139 (40) |
| **Feel hands hygiene is apt, so hopeful** | 39 (11.2) | 15 (4.4) | 293 (84.4) |
| **Protective material available for my personal use** | 6 (1.6) | 49 (14.2) | 292 (84.2) |

Explicitly, on adherence to guidelines about COVID-19, 323 (93%), circumvent crowd 310 (89.3%), and maintain social distancing compliance 259 (74.6%); all had excellent compliance rate as reported in this study. However, these were no norm for some individual's adherence to guidelines about COVID-19 24 (7%), circumvent crowd 30 (8.6%) and maintain social distancing compliance 88 (25.4%).

Considering the unsafe (crude) practices, the observations obtained in this study are proof of low unsafe practices by the populace, this confers a protective effect, which is a benefit. The items of the questionnaire "preventive use of traditional medicine is what I do" showed 21 (6.1%), 295 (85%), and 31 (8.9%) for "maybe, no and yes" respectively. Moreover, "prophylactic antibiotic use is now my approach" illustrated 15 (4.3%), 308 (88.7%), and 24 (7%) for "maybe, no and yes" accordingly.

**Table 3: Frequency distribution of responses about practices towards COVID-19, (n=347).**

| Practices towards COVID-19 | Maybe, N (%) | No, N (%) | Yes, N (%) |
|---|---|---|---|
| **COVID-19 rules/guideline** | | | |
| Adherence to guidelines about COVID-19 | 0 (0) | 24 (7) | 323 (93) |
| Circumvent crowd | 7 (2) | 30 (8.6) | 310 (89.3) |
| Maintain social distancing compliance | 0 (0) | 88 (25.4) | 259 (74.6) |
| **Substance use/abuse** | | | |
| Preventive use of traditional medicine is what I do | 21 (6.1) | 295 (85) | 31 (8.9) |
| Prophylactic antibiotics use is now my approach | 15 (4.3) | 308 (88.7) | 24 (7) |

## DISCUSSION

The outcome of this study revealed the KAP of 347 respondents, randomly drawn based on the will to respond to the questionnaire administered during COVID-19 pandemic. This cross-sectional epidemiological study provided a situational account of the general strategies exercised by the public as at the prime period of the COVID-19 pandemic while concerns unfolded.

This study finding, which indicated high COVID-19 knowledge among the study population, is consistent with earlier studies. Remarkably, a cross-sectional survey in Pakistan observed similar results.[9] Similarly, a research to assess KAP towards COVID-19 in Malaysia recorded comparable results with ours.[10] Studies from Egypt (Abdelhafiz et al), as well as Kenya both align with the result of this study.[11] Further, Nigerian scholars Olapegba and colleagues (papers.ssrn.com) in preliminary assessment of novel Coronavirus (COVID-19) knowledge and perceptions in Nigeria shared equivalent report of adequate knowledge with this study. Further, the results of this study are in consonance with Zhong et al with 90% correct response recorded in a survey.[7] The high level of education explains the good rate in Zhong's study.

The educational status and accessibility to information through various communication media could be the reason for the high level of knowledge recorded in this study. The literate status of most respondents; up to tertiary level of education explain this positive outcome. Also, access to information, especially; through social media, which is the key channel for the dissemination of information to the nooks and crannies of the nation was noted. The role of social media in the dissemination of information and communication cannot be overemphasised as it has proven effective during the COVID-19 pandemic.[7,9,12]

Relatively, the high level of knowledge observed in this study is in opposition with previous studies in China and India revealed only moderate public knowledge.[13,14] Further variation in the results may be due to the time of study and exposure period of the pandemic. The outbreak then in 2019 at Wuhan China, was strange with little to no definite protocol and preventive strategies in place at that time. Importantly, the minimal experience and awareness of the disease possibly contributed to the rate seen in other studies.[13,14] China battled it alone and tried curtailing its spread before it was declared a pandemic. Before the pandemic era, public health and awareness campaigns were not much.

However, at the time of this study, with the declaration of a pandemic there has been many sensitization, tips from various media channels and combined efforts of WHO, Nigeria centre for disease control, nongovernmental organizations and all tiers of government. Hence, the

residents of Nigeria were well informed and protective behaviours were maintained to avoid contracting the virus. This was facilitated by the news and pictures seen in the severely affected countries such as; USA and Italy so; fear could have caused the rate of compliance observed in this study. Also, some guidelines were forcefully implemented by the government of Nigeria, as such; the residents were left with no option than to adhere.

Knowledge level of the public as observed in this study is impressive and the role of exposure to knowledge in flattening the curve cannot be overemphasised. A good knowledge of the challenge is the basis for right attitude and a vital step towards behavioural change in the right direction. It is good one for the country of this study whose prevention method of choice is awareness and enlightenment campaign as observed in this study. Good knowledge level is a crucial step as it touches preparedness for containing the dreaded novel Coronavirus.

Our findings are in tandem with previous studies with respect to the positive attitude towards the COVID-19 disease.[13] We report right attitudes of the respondents towards COVID-19 pandemic. Being optimistic has been linked to knowledge as proven by an earlier study. There is a correlation between good knowledge of COVID-19 and positive attitude towards COVID-19.[15] The report of this study, which showed good knowledge may invariably be attributed to the effect seen in the attitudes of the respondents, which is commendable. Nevertheless, most respondents believed that government's restrictions are more dangerous than the novel Coronavirus due to the disruption of these restraints to survival pursuits. The preventive intervention strategies of government, such as partial or total lockdown of clubs, religious and other gathering, including market places to curb transmission even in asymptomatic cases seemed rigorous for the residents. These poor attitudes have led to poor adherence to government guidelines about the COVID-19 with the disposition that, the risk of losing a livelihood supersedes the menace of dying of the novel Coronavirus. The lack of respect for these restrictions may have been worse considering the poor distribution of palliatives in Nigeria. This is contrary to what was observed in other countries. This finding is backed up by an independent finding as seen from the review of literature.[16] Nevertheless, attitude is influenced by knowledge. Good knowledge results in the right attitude, which will be observable in practical ways.

The demonstration of the application of good practices otherwise known as preventive interventions as observed in this study have differing attribute as seen in other areas. The COVID-19 pandemic guidelines emphasised partial or complete lifestyle changes and practices. Pragmatically, the respondents observed various practices; both safe and unsafe, although unsafe practices were limited. Safe practices found here ("Adherence to guidelines about COVID-19, circumvent crowd and Maintain social distancing compliance") are comparable with observations from previous works. Reuben et al in an epidemiological survey in North-Central Nigeria observed good compliance to various precautionary measures by most respondents.[15] Adherence to safety practices has been identified as effective in the fight against the virus and suggests a positive position of the residents to flatten the curve through preventive intervention behavioural change. This could be interpreted to be in compliance with government policies on COVID-19. Further, it is a reflection of the effects of the COVID-19 awareness programmes of the Nigeria centre for disease control.

Conversely, unsafe and crude practices that were evident in this study are harmful. These dangerous practices can be linked to illiteracy, marital status, and risk-taking behaviour among the respondents.[17] Evidently, the consciousness of the public regarding self-protection still needs to be reinforced. Unsafe practices of the public can be corrected by intervention through health education.[18] This study has confirmed good knowledge, right attitude, and good adaptation to safe behavioural practices. The rapid change in behaviour has been linked to the ability of the populace to possess quality knowledge about the virus ravaging the world to be safe. This behavioural is a good sign of usage of the protective behavioural guidelines for COVID-19, which has been widely communicated.[19]

## CONCLUSION

This study demonstrates good knowledge, right attitude, and best practices evident in adherence to safe practices and abhorrence of unsafe practices towards the novel Coronavirus in Nigeria. This has shown the interactions of knowledge, attitude, and practice as preventive intervention strategies. Nonetheless, these behavioural interventions may perhaps not be achieved in the absence of the requisite knowledge that will shape attitudes to bring about the practices of protective behaviours among residents. However, a small percentage of the study respondents still show the need for more enlightenment. Importantly, lifestyle modification otherwise known as behavioural change was more attributed to non-communicable diseases before the advent of the novel Coronavirus but it is the mainstay in the COVID-19 era. It is a form of preventive intervention that is effective during the COVID-19 pandemic to curtail transmission and wide spread while the globe awaits release of vaccine intervention against the novel Coronavirus.

Attention should be drawn towards the percentage, though low, that is likely to be jeopardy to the good rate observed in this study. This category includes; residents with little to no knowledge, those with poor inappropriate attitude towards the COVID-19 pandemic, as well as those who neither applied safe practices nor downplayed crude and unsafe practices. Also, another group to be

reached are those with an undecided state. These categories pose a threat to the general populace. Therefore, individuals, corporate bodies including governments should intensify work in this direction. Besides, further studies are encouraged in this direction with increased sample size to obtain a broader picture. Funding can be deployed as an incentive for improved response to questionnaires.

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