Original Article

Knowledge, Attitude, Practice and Predictors of Preventive Practices Toward COVID-19 among Healthcare Workers in Ogbomoso, Nigeria: A Cross-sectional Study

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Abstract

Background: COVID-19 quickly assumed a global epidemic with its attendant health, socio-political and economic impacts. Healthcare workers are particularly at increasing risk of being infected and transmitting the virus. This study assessed knowledge, attitude, practice and predictors of preventive practices toward COVD-19 among healthcare workers in Ogbomoso, Nigeria. **Study Design:** Cross-sectional study. Data were collected online among health workers across health facilities in Ogbomoso. Factors associated with good practices were analyzed using Chi-square. Predictors of good preventive practices were determined by multivariate binary logistic regression. The level of statistical significance was determined to be at $P < 0.05$. **Results:** There were 132 study participants; with an average age of 31 years. Fifty-eight percent were medical laboratory scientists. Levels of good knowledge, attitude, and practices were 59.1%, 58.3%, and 38.6%, respectively. Eight-seven percent of respondents sourced COVID-19 related information via the mass media. Ninety-four percent of respondents will not stay at home if sick because of work. Age, profession, and knowledge are significantly associated with COVID-19 preventive practices. The predictors (Model II) of good COVID-19 preventive practices include being a laboratory scientist (odds ratio [OR]: 2.44 [95% confidence interval (CI): 1.05, 6.71]; $P = 0.039$), working in primary health facility (OR: 4.72 [95%CI: 1.08, 20.67]; $P = 0.039$) and having good COVID-19 knowledge (OR: 3.71 [95%CI: 1.49–9.925]; $P = 0.005$). **Conclusion:** Our study has shown the predictors of good COVID-19 preventive practices among healthcare workers and the need for policy and practice change as it relates to COVID-19 infection prevention and mitigation among healthcare workers.

Keywords: Attitude, COVID-19, healthcare workers, knowledge, Nigeria, practice

Introduction

China reported pneumonia cases of unknown etiology in Wuhan; of which 7 cases were severe as of December 31, 2019.[1,2] The cases that were reported to show pneumonic symptoms and bilateral lung infiltrate on X-rays.[2,3] Later in January, the China Centre for Disease Control reported that a new coronavirus severe acute respiratory syndrome coronavirus 2 was reported to be the cause of a quarter of the pneumonia cases earlier reported;[2] whose genomic sequence subsequently first made public thereafter.[1]

Ten days after, there were reported confirmed cases in South Korea, Thailand, and Japan;[1,2] which were all said to have been exported from China. Wuhan city was subsequently locked down and all forms of migration were prohibited.[4] The case definition of the virus has changed several times and countries have subsequently changed their testing approaches to determine eligibility for testing.[5]

The first reported EU case was from France with a China travel history.[5] By January 30, 2020, the COVID-19 pandemic was

Access this article online

Quick Response Code:

Website: www.njmonline.org

DOI: 10.4103/NJM.NJM_86_21

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How to cite this article: Adeoye PA, Oke GI, Fadele KP, Awotunde TA. Knowledge, attitude, practice and predictors of preventive practices toward COVID-19 among healthcare workers in Ogbomoso, Nigeria: A cross-sectional study. Niger J Med 2021;30:452-7.

Submitted: 11-May-2021 **Revised:** 19-Jun-2021
Accepted: 20-Jun-2021 **Published:** 17-Aug-2021

declared a public health emergency of international concern by the WHO.[1] COVID-19 has thus affected 216 countries/territories since its first report in China[6] The first reported COVID-19-related death was from the Phillippines.[7] On February 27, 2020, the first case of COVID-19 was reported in Nigeria.[8]

Healthcare workers are at an increased risk of COVID-19 infection and transmission compared to the general population. Health workers' COVID-19-related attitude has been optimistic and has been largely adherent to precautions to prevent infection by COVID-19 in many parts of the world.[9,10] These are however largely average in many places in Africa.[11-13] There is still a dearth of knowledge as regards COVID-19 knowledge, attitude, and preventive practices among health workers and therefore a rationale for this research.

This study assessed knowledge, attitude, practice, and predictors of preventive practices towards COVD-19 among healthcare workers in hospitals in Ogbomoso, Nigeria.

Materials and Methods

This is a cross-sectional study. The study was done in April 2020 among healthcare workers across health facilities in Ogbomoso. Ogbomoso is a city in the southwestern part of Nigeria. The majority population is of the Yoruba ethnic group. It is home to two teaching hospitals, a general hospital, and about 25 primary healthcare centres. Online collection of data was done using Google® form - a cloud base system data collector due to the need to mitigate the transmission of COVID-19 during the process of data collection. The form (https://forms.gle/E7FP3V1Z5Wsgw6sL7) was shared across WhatsApp platforms of the various professional groups in Ogbomoso. The tool was pretested to remove ambiguity and ensure clarity, appropriateness, and acceptability.

The major instrument that was used in collecting data for this study was developed by the researchers. The 31-item questionnaire was both positively and negatively worded. The survey tool has sections for socio-demographic factors, knowledge, attitude, and preventive practice-related items. The attitude items were on a 3-point Likert scale. Knowledge and practice questions were in a "yes/no" format. All correct answers were assigned a score of 1; otherwise 0. Cochran formula was used to calculate the sample size: $n = Z^2pq/d^2$;[14] where Z = Standard normal deviate (1.96); *P* = proportion of outcome in prior study among similar population (0.887);[10] q = alternate outcome (1 − P = 0.113) and d = desired level of precision (0.05). Minimum sample size = 154. Final sample size after accounting for10% nonresponse = 169.

Data were downloaded into Microsoft Excel 2010 and was subsequently exported into SPSS V.21 (IBM Corp Armonk, NY. USA). Data were cleaned and normality tested. Summary measures were presented as median and interquartile range, and qualitative variables were presented as frequency and proportion. The average score for each of the domains was calculated and average scores (and its percentage) will be obtained. The average score was used to categorize domains into good/poor levels of knowledge, attitude, and practice. Factors associated with good practice were assessed with Chi-square. Predictors of good preventive practices were assessed using the multivariate binary logistic regression. All variables were loaded into the omnibus multivariate logistic regression. Only variables at $P < 0.10$ were loaded into the second omnibus multivariate analysis. Statistical significance is at $P < 0.05$.

All the research process comply with national and institutional guidelines. The conceptualization and conduct of this study follow the Committee on Publication Ethics guidelines. The anonymity and confidentiality of respondents were secured throughout the study. The online questionnaire can only be accessed by attempt and completion of the questionnaire; which was predicated on the act of clicking "submit."

This study was approved by the Bowen University Teaching Hospital Research Ethics Committee, Ogbomoso, Nigeria (Reg. No. NHREC/12/04/2012. Approval No. BUTH/REC-129).

One hundred and thirty-two respondents responded to the online survey (78.10% response).

The average age of study respondents was 31 (95% confidence interval [CI]: 36.5–27.0) years. The majority were between ages 26 and 64 years; of Yoruba tribe; of the Christian religion; and works in the secondary/tertiary levels of care. More than two-thirds were females and had worked for more than three years. About half are laboratory health workers [Table 1].

The average knowledge, attitude and preventive practices of COVID-19 are 80% (95% CI: 90.0–70.0), 80% (95% CI: 90.0–70.0) and 79% (95% CI: 92.8–66.1), respectively. Almost a third had good knowledge and attitude. However, just a little above one-third observe safety practices against COVID-19 infection [Table 2].

Mass media is the major source of COVID-19 related information among health workers in Ogbomoso as 87.1% have their source of COVID-19 related information to be mass media [Figure 1].

The most recurring reason (with 94% of respondents) for sick health workers not staying at home is the need to be at work to care for the sick [Figure 2].

Age, profession, and knowledge are associated significantly with COVID-19 infection preventive practices. A higher proportion of those at prime-mature working age; medical lab scientists and those with good knowledge significantly have good COVID-19 preventive practice against infection [Table 3].

Figure 1: Sources of information about COVID19 among healthcare workers in Ogbomoso

Table 1: Sociodemographic attributes of respondents (*n*=132)

Variables	Frequency (%)
Age (years)	
Early working age (15-24)	24 (18.2)
Prime-mature working age (26-64)	108 (81.8)
Median (IQR)	31 (36.5-27.0)
Tribe	
Yoruba	115 (87.1)
Non-Yoruba	17 (12.9)
Sex	
Male	40 (30.3)
Female	92 (69.7)
Religion	
Christianity	128 (97.0)
Islam	4 (3.0)
Professions	
Lab health workers	71 (53.8)
Clinical health workers	61 (46.2)
Medical laboratory workers	71 (53.8)
Nursing	33 (25.0)
Doctors	28 (21.2)
Years of practice (years)	
<3	41 (31.1)
>3	91 (68.9)
Median (IQR)	5 (8.0-1.0)
Level of practice (*n*=129)	
Primary	13 (9.8)
Secondary-tertiary	116 (89.9)

IQR=Interquartile range

Table 2: Levels of coronavirus disease 2019 knowledge, attitude, and preventive practices among health workers (*n*=132)

Variables	Frequency (%)
Knowledge	
Poor knowledge	54 (40.9)
Good knowledge	78 (59.1)
Median % (IQR)	80 (90.0-70.0)
Attitude	
Poor attitude	55 (41.7)
Good attitude	77 (58.3)
Median % (IQR)	80 (90.0-70.0)
Preventive practices	
Poor practice	81 (61.1)
Good practice	51 (38.6)
Median % (IQR)	79 (92.8-66.1)

IQR: Interquartile range

The predictors of good COVID-19 preventive practices are being a laboratory scientist, working in a primary health facility, and having good COVID-19 knowledge. Laboratory workers were 2.4 times more likely to have good preventive practice against COVID-19 compared to clinical health workers. (odds ratio [OR]: 2.44 [95% CI: 1.05–6.71]; *P* = 0.039). Workers at primary health centres were 4.72 times more likely to have good COVID-19 preventive practice compared to those in secondary-tertiary facilities. (OR: 4.72 [95% CI: 1.08–20.67]; *P* = 0.039). Those with good COVID-19 knowledge were 3.71 times more likely to have good preventive practice against COVID-19 compared to those with poor knowledge. (OR: 3.71 [95% CI: 1.49–9.925]; *P* = 0.005) [Table 4].

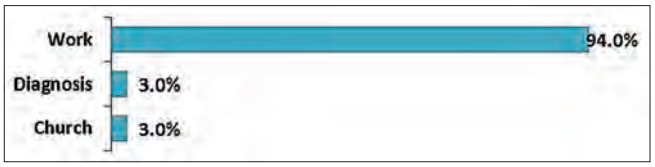

Figure 2: Reasons for not staying at home when unwell among healthcare workers in Ogbomoso

Discussion

This study shows that the most common source of information is the mass media. Among respondents that will not remain at home in case of any illness despite the COVID-19 pandemic cited the need to be at work. Many respondents have good knowledge and attitude about COVID-19 infection. However, only a third complied with the safety preventive practices. Significant predictors of good preventive practices include being a laboratory health worker, working in a primary health facility, and having a good COVID-19 knowledge.

Mass media is the most popular source of information among study respondents. This is akin to a similar study by Olapegba *et al*. in an assessment of knowledge and attitude in Nigeria.[15] This is however different from those observed among Pakistani healthcare workers and Jordanian University students which reported internet sources (websites and social media) as the most common source of COVID-19-related information.[12,16] This may be a result of geographic, demographic, and behavioural differences between the two populations.

This study shows that some workers will be under pressure to be at work despite the ongoing pandemic. Reasons given for this risky behaviour include the fear of losing their job, absent financial support/protection when not at work, getting quarantined, stigmatization, being identified as a source of infection transmission at the workplace.[17,18]

Almost two-thirds of respondents have good COVID-19 related knowledge and attitude. This is similar to studies among healthcare workers in the Ofinso-North district of Ghana and Uganda's tertiary hospital. However, healthcare workers in Uganda's tertiary hospital study had a significantly lower attitude compared to this study respondents. Both Uganda's and Ghanaian studies show better preventive behaviours compared to respondents in the current study.[12,13] Outside Africa, healthcare workers in Pakistan show improved practices, knowledge, and attitude compared to the current study.[10] This may be due to the increasing difficulty of accessing personal protective equipment (PPEs) among African countries.

Table 3: Association between healthcare workers' sociodemographic, knowledge, attitude, and preventive practice against coronavirus disease 2019

Variable	Practice, frequency (%)		χ^2	*P*
	Poor	Good		
Age				
Early working age	19 (79.2)	5 (20.8)	3.921	0.048*
Prime-mature working age	62 (57.4)	46 (42.6)		
Tribe				
Yoruba	69 (60.0)	46 (40.0)	0.700	0.403
Non-Yoruba	12 (70.6)	5 (29.4)		
Sex				
Male	22 (55.0)	18 (45.0)	0.980	0.322
Female	59 (64.1)	33 (35.9)		
Religion				
Christianity	78 (60.9)	50 (39.1)		1.000††
Islam	3 (75.0)	1 (25.0)		
Profession				
Medical lab science	39 (54.9)	32 (45.1)	7.114§	0.029*
Nursing	19 (57.6)	14 (42.4)		
Doctor	23 (82.1)	5 (17.9)		
Level of practice				
Primary	6 (46.2)	7 (53.8)	1.365§	0.546
Secondary	16 (64.0)	9 (36.0)		
Tertiary	57 (62.6)	34 (37.4)		
Years of practice				
<5	42 (66.7)	21 (33.3)	1.430	0.232
>5	39 (56.5)	30 (43.5)		
Knowledge				
Poor knowledge	40 (74.1)	14 (25.9)	6.227	0.013*
Good knowledge	41 (52.6)	37 (47.4)		
Attitude				
Poor attitude	34 (61.8)	21 (38.2)	0.008	0.928
Good attitude	47 (61.0)	30 (39.0)		

*Significant at $P<0.05$, §Chi-square likelihood ratio, ††Fisher's exact

This might have led to the increasingly high prevalence of COVID-19 infection among health workers in many African countries.[19]

This study reveals that good knowledge is a significant predictor of good preventive practices among healthcare workers. This is similar to studies from Ethiopia, Bangladesh, and China which shows similar outcome among healthcare workers and the general population.[11,20,21] The main goal of information acquisition is behavioural change and improvement in practice; which have been shown by this study.

This study shows that laboratory workers have significantly better preventive practices compared to doctors and nurses. This is similar to studies from Pakistan and Tanzania that showed that being a non-clinical staff (laboratory and pharmacy workers) significantly predict good preventive practices compared to clinical staff.[10,22] This may be due to reduced risk attitude; the volume of human interaction, limited provision of PPEs, and increased need for rationing of protective consumables and equipment in clinical settings.

This study shows that healthcare workers in primary health care facilities have better preventive practices compared to those in secondary-tertiary health settings. This is contrary to the general belief that increased knowledge and specialization at higher levels of care comes with improved infection prevention and control. This may be as a result of the fact that primary healthcare staff were given organized training, publication of guidelines, and provision of infection prevention equipment by regulatory agencies at the outset and during the pandemic.[23] Higher levels of healthcare systems are often overwhelmed with COVID-19 management in the presence of limited supply and rationing of PPEs; often hampering optimal preventive practice at this level of care.

Furthermore, early participatory training of health workers in infection prevention and mitigation will be necessary to improve risk perception and preventive practices; especially at the secondary and tertiary levels of care. Provision of PPEs and sanitizing products should be provided for healthcare workers as they attend to patients in this era of the COVID-19 pandemic.[24]

The limitation of this study may be in its self-reported nature which might lead to social desirability bias and subjective responses that may lead to over-reporting of desirable practices. Non-response in this study, especially by doctors and nurses, may bias the conclusion of this study. This might be due to the heavy workload experienced by this category of healthcare workforce during the pandemic.

Conclusion

Our study has outlined the various factors that may predict good COVID-19 preventive practices among the study population. Our findings lay a foundation for further work for the implementation of interventions that may improve infection prevention and control behavioral change among healthcare workers. It also laid the ground for further study in determining the barrier to good preventive practices among healthcare workers; especially in resource-constrained settings.

Highlights

- COVID-19 has quickly assumed a pandemic status with its attendant impacts
- Good knowledge, early promotion of infection prevention and control, and a higher risk attitude are predictors of good preventive practices
- There is a need for improved policy and practice as it relates to infection prevention and control pandemics.

Acknowledgment

We will like to appreciate all members of the medical, nursing, and laboratory groups who participated in the study. We will also like to appreciate Precious Folaranmi of the Department of Medical Laboratory Science, Ladoke Akintola University of Technology, Ogbomoso who helped out with data collection.

Table 4: Predictors of coronavirus disease 2019 preventive practice among healthcare workers

Variable	Model I		Model II	
	aOR (95% CI)	*P*	aOR (95% CI)	*P*
Age	1.01 (0.95-1.07)	0.870	-	-
Tribe				
Yoruba	3.58 (0.78-16.50)	0.102‡	2.42 (0.65-8.98)	0.186
Non-Yoruba (reference)				
Sex				
Male (reference)				
Female	1.16 (0.46-2.98)	0.754	-	-
Profession				
Lab health worker	2.68 (1.10-6.53)	0.030*,‡	2.44 (1.05-6.71)	0.039*
Clinical health worker (reference)				
Years of practice	1.06 (0.98-1.14)	0.135‡	1.05 (1.00-1.11)	0.050
Level of practice				
Primary	5.32 (1.14-24.78)	0.033*,‡	4.72 (1.08-20.67)	0.039*
Secondary-tertiary (reference)				
Knowledge				
Good knowledge	3.97 (1.52-10.35)	0.005*,‡	3.71 (1.49-9.25)	0.005*
Poor knowledge (reference)				
Attitude				
Poor	1.497 (0.58-3.89)	0.407	-	-
Good (reference)				

*Significant at $P<0.05$, ‡Significant at $P<0.1$ in the omnibus Model I; and included in the Model II of the multivariate. aOR: Adjusted odds ratio, CI: Confidence interval

We will also like to appreciate Dr. Lois Ademola, Alogwu Godwin Owoicho (University of Jos) and Dr. David Berlin (Jos University Teaching hospital) for proofreading the manuscript.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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