



Healthcare Workers' Perception of Government's Response to the Covid-19 Outbreak in Lagos, South-west, Nigeria

Bakare Omowunmi Q, Adeniran Adeyinka, Akinyinka Modupe R, Goodman Olayinka, Adebayo Busola, Odugbemi Babatunde A, Kuyinu Yetunde A, Wright Ololade K, Odusanya Olumuyiwa O.

Departments of Community Health & Primary Health Care
Lagos State University College of Medicine, Ikeja, Lagos, Nigeria

**Author for Correspondence:*

Bakare O. Q.

Email: omowunmi.bakare@lasucom.edu.ng

Keywords:

COVID-19,
Government's
response,
Perception,
Outbreak,
Healthcare worker,
Pandemic

ABSTRACT

Objectives: The objectives of the study was to assess healthcare workers' knowledge of COVID-19 and their perception towards government's response in Lagos, South-west, Nigeria.

Methods: Using a descriptive cross-sectional study design, a total of 402 healthcare workers were selected using a probability sampling methodology and a web-based google form for data collection. Data was analyzed using SPSS version 25 software and presented as frequency tables, charts and standard deviation. Association between categorical variables was established using chi-square and the level of statistical significance set at $p < 0.05$.

Results: Mean age of respondents was 38.8 ± 10.7 SD. More than two-thirds of respondents were females, doctors (31.4%) and health record officers (26.3%). Most (82.3%) of the respondents demonstrated good knowledge about COVID-19 transmission, symptoms and preventive practices. More than half (55.2%) of the respondents disagreed that the government's response was well coordinated. There was statistically significant association between the socio-demographic characteristics (age group and marital status) and the knowledge of the healthcare workers towards COVID-19 outbreak ($p = 0.001$) and ($p = 0.036$) respectively.

Conclusions: Although, several activities were implemented to curb the spread of COVID-19 outbreak, perception of the healthcare workers to government's response was observed to be sub-optimal. Government and other relevant stakeholders strengthen the Primary Health Care Systems to detect and respond to subsequent epidemics and also engender confidence among the healthcare workers.

INTRODUCTION

COVID-19 is a respiratory illness that can spread from person to person. It is caused by a novel coronavirus called SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus-2). The current outbreak of the novel coronavirus was first recognized in Wuhan City, Hubei Provinces, China in December 2019.[1] Coronavirus (CoV) infections are emerging respiratory viruses and are known to cause illness ranging from the common cold to severe acute respiratory syndrome (SARS).[2] CoV is a zoonotic pathogen that can be transmitted via animal-to-human, faeco-oral and human-to-human interaction.[3] The common symptoms are fever, cough, tiredness and later difficulty in breathing. The virus causing Covid-19 seems to spread via droplets when someone coughs or through contact with droplets on another object if the eyes, nose, or mouth are then touched.[3]

The World Health Organization (WHO) declared Covid-19 a Public Health Emergency of International Concern (PHEIC) under the International Health Regulations

(2005) on January 30, 2020.[4] A PHEIC is a decision made by WHO Director-General on the evidence collected from many different sources about a current infectious disease outbreak, Nigeria reported the first case of COVID-19 in sub-Saharan Africa on 27 February, 2020.[5] Analysis by Amnesty International as at 3rd September, 2020, found that at least 7,000 health workers had died around the world after contracting COVID-19 and 1,320 healthcare workers were confirmed to have died in Mexico alone, the highest figure then. At the early part of the pandemic, there were high numbers of health worker deaths in the USA (1,077) and Brazil (634), where infection and death rates had been high, as well as alarming figures in South Africa (240) and India (573), where infection rates had soared in recent months.[6] A study from 37 countries, published in October, 2020, found nearly 300,000 health workers had been infected with COVID-19, and 2,500 had died from the virus due to inadequacy of personal protective equipment (PPE).[7]

WHO Director-General declared the COVID-19 outbreak a pandemic.[8] In responding to the COVID-19

outbreak, many countries were using a combination of containment and mitigation measures with the intention of reducing the spread of the disease and reducing the demand for hospital beds. Similarly, there was the need to protect the most vulnerable members of the society especially the elderly and those with comorbidities. Most national response strategies of the various countries included varying levels of contact tracing, self-isolation or quarantine, promotion of public health measures which included frequent hand washing with water and soap, respiratory etiquette and social (physical) distancing. Equally essential was the preparation of the health systems for a surge of severely ill patients who would require isolation, oxygen administration and mechanical ventilation. It also included the strengthening of the health facility infection prevention and control with special attention to nursing homes and postponement or cancellation of large-scale public gatherings.[9]

Several countries affected by Covid-19 pandemic adapted several measures at one point or the other, which included travel ban, lockdown, social distancing, extensive public information and education, establishment of treatment centers etc. The measures adopted in Nigeria in response to reduce the spread of Covid-19 included the strengthening of surveillance at five (5) international airports to prevent the spread of Covid-19, ban of in-flights from countries with high burden, early activation of Incident Management System (IMS) especially in Lagos State, which was the epicentre of the pandemic in Nigeria. The IMS had seven (7) pillars of operations namely – Coordination, Planning and Monitoring, Risk Communication and Community Engagement (Social Mobilization), Infection Prevention and Control, Epidemiology/Surveillance, Contact tracing and case investigation, Case management, Laboratory and testing including Mental and psychological support.[9] Other features of the preparedness and response at the National level was the establishment of a Preparedness and Response Task force, known as the Presidential Task Force (PTF). This Committee was responsible for the coordination of the health and non-health (multisectoral) aspect of the response for the control of the spread of Covid-19. This response included the closure of all educational institutions, ban of travelers from 13 high risk countries to enter Nigeria (countries with more than 1000 cases of Covid-19).[10] Others included training and retraining of health workers, provision of Personal Protective Equipment (PPE) and adequate consumables etc.

Since the pandemic spread, health care workers (HCWs) had been recognized as a uniquely high risk group. There were several reports of front line HCWs, physicians, nurses and other health care workers who had contacted COVID-19 and had died.[11] According to WHO, as at December, 2020, over 1.4 million infections of Covid-19 had been accounted for by the healthcare sector workers, at least 10% of all cases.[12] Reports from the healthcare workers also described physical and mental exhaustion, the torment of difficult triage decisions, and the pain of losing patients and colleagues, all in addition to the infection risk.[13] Similarly, in Italy, more than 5,000 doctors, nurses and technicians were reported in other countries such as USA, UK, Iran, Sweden etc.[14-16] A web-based study of HCWs about COVID-19 in United Arab Emirates, reported that a significant proportion

(61%) of the HCWs had poor knowledge of its transmission. However, a significant proportion of the HCWs had a positive perception to Covid-19 prevention and control.[17]

As at 22nd February, 2021, more than 111 million cases had been confirmed with over 2 million deaths with Nigeria having almost 152,000 confirmed cases and more than 1,839 deaths.[18] As the epicentre of Covid-19 in Nigeria, Lagos had over 54,613 confirmed cases and more than 300 deaths.[19] Community spread of Covid-19 was acknowledged and the government had to put in place several measures to curb the spread disease within the community. Such measures were non-pharmaceutical interventions which included infection prevention and control through frequent washing of hands with water and soap, use of alcohol-based sanitizer, provision of adequate Personal Protective Equipment (PPE), use of infrared thermometers to take the temperature of the people, enforcing social distancing, closure of all educational institutions, free maternity health services at government hospitals, avoidance of mass gatherings, provision of relief materials (palliatives) for the people to cushion the effects of hardships caused by the total lockdown.

As result of the impact of the pandemic, HCWs were working under extreme pressure for long hours without breaks and without day offs, and this really took a huge toll on their physical, mental and social health. There were reports of inadequate provision of PPE or re-use of PPE in some countries. The government informed the healthcare workers that infection prevention and control measures had been put in place and these included PPE such as medical masks, gloves, disposable gowns, face shields etc. However, the Nigerian Medical Association (NMA) and other professional groups reported that PPE were inadequate because many HCWs contracted COVID-19 due to insufficient and re-use of PPE.[20] As HCWs are the frontline personnel to facilitate curbing the spread of COVID-19 in the community, it then became imperative that HCWs should confidence in the various government strategies in responding to COVID-19. Therefore, the study sought to assess the knowledge of COVID-19, perception of government's response among the healthcare workers in Lagos, South-west, Nigeria.

MATERIALS AND METHODS

The study was conducted among HCWs in both private and public health facilities in Lagos State. It was a web-based, cross-sectional study to assess the knowledge of COVID-19 and perception of the HCWs towards government's response to the pandemic. The study population comprised of HCWs from all the levels of health care delivery systems (Primary, Secondary and Tertiary). There was one tertiary health facility, 26 secondary health facilities and 276 functional Primary healthcare facilities.

Sample Size Determination

Minimum sample size was calculated using Fisher's formula for cross-sectional study where $n = Z^2pd/d^2$ where p is the prevalence (51%) of good perception in a previous study.[21] At 95% level of confidence, $Z = 1.96$, $q = 1 - p$ and $d =$ error margin of 5% leading to a minimum sample size of approximately 384. About 5% non-response rate was factored in and the minimum sample size was increased to 402.

Sampling Methodology

The respondents were selected using a multi-stage random sampling methodology. In stage one, one public tertiary health facility, 15 public secondary and 170 public Primary healthcare facilities were selected using a simple random sampling method by balloting. In stage two, respondents were selected from the health facilities using a simple random sampling method. For the private health facilities, respondents were selected using a simple random sampling method by balloting.

Study Duration

The study was conducted between June -September 2020 among the healthcare workers in Lagos State.

Data Collection Instrument

The survey instrument was developed using the WHO resource materials on country level preparedness and response as well as other literature from China, Italy and Nigeria.[22-23] The survey instrument comprised of 4 sections of 45 closed-ended questions - Socio-demographic characteristics of the HCWs, knowledge of COVID-19, perceptions of government's preparedness and response towards COVID-19. The questionnaire was developed using a web-based google format. Face validation of the tool was done by distributing to 10 randomly selected faculty members of Lagos State University College of Medicine Ikeja. Pre-testing of the tool was conducted physically among 25 randomly selected HCWs in similar facilities in Lagos State for relevance, acceptability and reliability. The final data collection tool was further corrected to improve its comprehension.

Data Analysis and Management

Data collected was sorted, cleaned and analyzed using Statistical Packages for Social Sciences (SPSS) version 25 (IBM, Armonk, NY, USA).[24] Descriptive analysis (Frequencies, proportions, means and Standard Deviation) was done. Chi-square test was used to establish association or otherwise, between the categorical variables. A p-value of less than 0.05 ($p < 0.05$) was considered to be statistically significant.

Knowledge and Perception about Covid-19

A scoring system was made to measure the level of knowledge on Covid-19. The knowledge section consisted of five sub-sections - 6 questions on transmission of Covid-19, 10 questions on symptoms, 2 questions on treatment, 4 questions on complications and 8 questions on prevention. One mark was allocated for each correct answer and no mark for incorrect answer. The total score was 30 marks. Each respondent's total score was converted to percentage. The scores were graded as good or poor. Scores less than 50% were graded as poor while those greater than 50% was graded as good knowledge. For the perception score, a 3-point Likert scale (Disagree, Indifferent and Agree) was used for the assessment of the HCW's perception towards Covid-19 and government's response. Respondents could disagree, be indifferent and agree to statements and each statement was scored accordingly with 3 as the highest possible score and 1 as the least score. There were 18 statements in all, so maximum possible score was 54, while minimum score was

18 and the mid-point score was established as 27. Each respondent's total score was converted to percentage. Perception scores less than 50% were graded as negative while those greater than 50% were graded as positive.[25]

Ethical Considerations

Ethical approval was obtained from the Health Research and Ethics Committee of the Lagos State University Teaching Hospital (LASUTH), Ikeja (RefNo: LREC/ 06/10/ 1370). Information provided by the respondents was accorded confidentiality. Participation in the study was voluntary and non-compensated. Informed consent was obtained from each respondent before participation. The study was performed following the Helsinki Declaration as revised in 2013,[26] and conducted following the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) guidelines.[27]

RESULTS

More than half (62.7%) of the respondents were aged between 21-40 years and the mean age was 38.93 ± 10.7 SD. The majority (71.9%) were females, married (68.9%), doctors (31.3%), health records officers (28.1%) and nurses (25.1%). Most (89.6%) of the respondents worked in public health facilities. Half (50.0%) of the respondents had previous training on COVID-19. (Table 1) Most (95.0%) of the respondents correctly identified that COVID-19 could be transmitted via droplets, (94.8%) infected persons, (94.3%) infected surfaces and (36.1%) via faeco-oral route. Almost all (99.8%) of the respondents correctly identified the symptoms of COVID-19 as difficulty in breathing, (98.6%) fever, (96.5%) dry cough, (95.5%) sore throat, (87.3%) tiredness, (74.1%) body pains and (60.7%) diarrhoea. Almost all (99.5%) of the respondents reported that COVID-19 could lead to death, (97.3%) respiratory failure, (78.1%) pneumonia and (55.7%) renal failure. Only 28.6% reported that Chloroquine was the treatment of COVID-19 and (94.3%) also reported that supportive care was the main management of COVID-19. (Table 2) All (100%) of the respondents knew the preventive measures of COVID-19 as washing hands more frequently, (99.5%) avoiding crowded and large gatherings, (99.8%) covering nose and mouth when coughing and (99.3%) avoided being close to people in public. Hence, the overall knowledge score was 82.3%. The most frequently used sources of information on COVID-19 were the regular news media/Television and Radio (33.2%), social media (29.8%), government websites (21.5%) and family and friends (15.5%). (Figure 1)

There was a statistically significant association between the knowledge of COVID-19 and the age group of the respondents ($p=0.001$). A higher proportion of respondents in the older age group had a good knowledge of COVID 19 compared to those in the younger age bracket. Similarly, there was a statistically significant association between the knowledge of COVID-19 and the marital status ($p=0.036$). (Table 3) The married respondents had a good knowledge of COVID-19 compared to those single, divorced or separated. This could be premised on the need to prevent the spread of COVID-19 to their family members.

Majority of the respondents (83.3%) disagreed that 5G mobile network could cause COVID-19, (95.5%) drinking alcohol and (89.7%) spraying chlorine could kill the virus.

Similarly, more than half (59.7%) of the respondents disagreed that COVID-19 was a death sentence. However, most (69.1%) of the respondents disagreed that Chloroquine could prevent or cure COVID-19. (Table 4) Therefore, perception of the respondents towards COVID-19 was considered positive.

With regards to the perception of respondents towards government's response to COVID-19, most (62.1%) of the respondents disagreed that adequate laboratory support, (60.8%) psychological support, (59.6%) welfare of healthcare workers and the people (60.1%) were made available. Similarly, more than half (53.8%) of the respondents disagreed that the entire government's response

Table 1: Socio-demographic characteristics of respondents

Variable	Frequency (n=402)	Percentage (%)
Age group (Years)		
21-30	103	25.6
31-40	149	37.1
41-50	77	19.2
51-60	65	16.1
>60	8	2.0
Mean±SD	38.93±10.7SD	
Gender		
Male	113	28.1
Female	289	71.9
Marital status		
Single	113	28.1
Married	227	56.5
Others	62	15.4
Religion		
Christianity	323	80.3
Islam	78	19.4
Others	1	0.3
Occupation		
Doctors	126	31.3
Nurses	101	25.1
Pharmacy	20	5.0
Laboratory scientist	15	3.7
Health record officers	113	28.1
Community health workers	27	6.8
Place of practice		
Public	360	89.6
Private	42	10.4
Previous training on COVID-19		
Yes	201	50.0
No	201	50.0

More than half (62.7%) of the respondents were aged between 21-40 years, (71.9%) were females, (68.9%) married, (31.3%) doctors, (28.1%) health records officers and (25.1%) nurses. Most (89.6%) of the respondents worked in public health facilities and half (50.0%) had had a previous training on COVID-19.

Table 2: Respondents' Knowledge of COVID-19

Variable	Frequency	Percent (%)
Transmission		
COVID-19 originated from Bats	207	51.5
Transmitted through airborne	215	53.0
Transmitted through droplet	382	95.0
Through contact with infected person	381	94.8
Through contact with infected surface	379	94.3
Through fecal-oral route	145	36.1
Symptoms		
Headache	310	77.1
Fever	396	98.5
Dry cough	388	96.5
Sore throat	384	95.5
Difficulty in breathing	401	99.8
Tiredness	351	87.3
Diarrhea	244	60.7
Vomiting	191	47.5
Body pain	298	74.1
Bone pain	156	38.8
Complications		
Pneumonia	314	78.1
Respiratory failure	391	97.3
Death	400	99.5
Renal failure	224	55.7
Treatment		
Chloroquine is currently the treatment for COVID-19	115	28.6
Supportive care is the current management for COVID-19	379	94.3
Prevention		
Washing hand more regularly	402	100.0
Avoid leaving the house	302	75.1
Avoid crowded and large gathering	400	99.5
Avoid being close to people in the public	399	99.3
Avoid touching the face	400	99.5
Covering nose and mouth while coughing	401	99.8
Adequate provision of PPEs	395	98.3
There is a currently vaccine for COVID-19	12	3.0
Incubation period of COVID-19 is 2-14 days	397	98.8

Most (95.0%) of the respondents correctly identified that COVID-19 could be transmitted via droplets, infected persons (94.8%), infected surfaces (94.3%) and via fecal-oral route (36.1%). Almost all (99.8%) of the respondents correctly identified the symptoms of COVID-19 as difficulty in breathing, fever (98.6%), dry cough (96.5%), sore throat (95.5%) and tiredness (87.3%). Almost all (99.5%) of the respondents reported that COVID-19 could lead to death, (97.3%) respiratory failure, (78.1%) pneumonia and (55.7%) renal failure.

was well coordinated. Therefore, overall perception of the HCWs towards government response was considered to be negative. There was a statistically significant association between the perception of the HCWs towards government's response and occupation (health record officers ($p=0.001$), community health workers ($p=0.004$)). (Table 5)

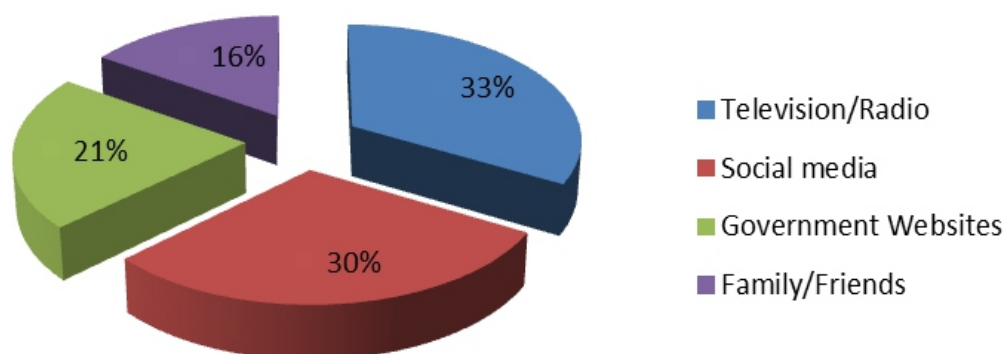


Figure 1: Sources of information on COVID-19
Television and Radio (33%) remained the main source of information on COVID-19, followed by social media (30%).

Table 3: Association between knowledge of COVID-19 and socio-demographic characteristics of the respondents.

Variable	Good (n=331)	Poor (n=71)	X ²	p-value
Age group (Years)				
21-30	70(68.0)	33(32.0)	24.856	<0.001*
31-40	127(85.2)	22(14.8)		
41-50	64(83.1)	13(16.9)		
51-60	62(95.4)	3(4.6)		
>60	8(100.0)	0(0.0)		
Gender				
Male	97(85.8)	16(14.2)	1.326	0.250
Female	234(81.0)	55(19.0)		
Marital status				
Single	84(74.3)	29(25.7)	6.960	0.031*
Married	237(85.6)	40(14.4)		
Others	10(83.3)	2(16.7)		
Occupation				
Doctor/Dentist	108(85.7)	18(14.3)	4.836	0.436
Nurses	86(85.1)	15(14.9)		
Pharmacy	16(80.0)	4(20.0)		
Laboratory scientist	13(86.7)	2(13.3)		
Health record officers	86(76.1)	27(23.9)		
Community health workers	22(81.5)	5(18.5)		
Place of practice				
Public	299(83.1)	61(16.9)	1.219	0.270
Private	32(76.2)	10(23.8)		
Previous training on COVID-19				
Yes	168(83.6)	33(16.4)	0.428	0.513
No	163(81.1)	38(18.9)		

There was a statistically significant association between the knowledge of COVID-19 and the age group of the respondents ($p=0.001$). A higher proportion of respondents in the older age group had a good knowledge of COVID 19 compared to those in the younger age bracket. Similarly, there was a statistically significant association between the knowledge of COVID-19 and the marital status ($p=0.036$).

Table 4: Respondents' perception of COVID-19 and Government response towards COVID-19

Variable	Perception of the respondents towards COVID-19		
	Disagree	Indifferent	Agree
5G could cause COVID-19	177 (83.3)	55 (13.7)	12 (2.9)
It could be caught in the hot weather	321 (79.6)	48 (11.9)	33 (8.2)
Once one is infected with COVID-19, it is a death sentence	238 (59.7)	1 (0.2)	6 (1.4)
If you can hold your breath for 10 seconds or more, you don't have COVID-19	327 (81.3)	52 (12.9)	22 (5.4)
Drinking alcohol will protect from COVID-19	384 (95.5)	13 (3.2)	24 (1.0)
Spraying chlorine or alcohol on the body will kill the virus in the body	360 (89.7)	27 (6.7)	12 (2.9)
Taking a hot bath will prevent infection	340 (82.4)	40 (10.0)	25 (6.2)
Regular rinsing of your nose with salt water will prevent infection	359 (89.4)	29 (7.2)	15 (3.9)
Taking antibiotics will prevent COVID-19 infection	329 (82.1)	15 (12.4)	22 (15.4)
Taking Chloroquine will prevent or cure COVID-19	297 (69.1)	89 (22.1)	32 (7.9)
Perception towards government's response			
Adequate provision of laboratory support	150 (62.1)	40 (10.0)	109 (27.1)
Adequate provision of psychological support for health care workers	245 (60.8)	43 (10.7)	114 (28.4)
Adequate provision of psychological support for the people	231 (57.4)	55 (13.7)	74 (28.3)
Adequate provision of welfare for the health care workers	240 (59.6)	44 (10.9)	117 (29.3)
Adequate provision of welfare for the people	282 (60.1)	51 (12.7)	106 (26.3)
Support for the easing of the lockdown	217 (53.8)	78 (19.4)	104 (25.8)
Support for intrastate travel restrictions	157 (39.0)	78 (19.4)	157 (39.0)
Response was well coordinated	222 (55.2)	78 (19.4)	93 (23.1)

Majority of the respondents (83.3%) disagreed that 5G mobile network could cause COVID-19 and also drinking alcohol (95.5%) and spraying chlorine (89.7%) could kill the virus. Similarly, more than half (59.7%) of the respondents disagreed that COVID-19 was a death sentence. However, most (69.1%) of the respondents disagreed that Chloroquine could prevent or cure COVID-19.

Table 5: Association between Social-demographic characteristics and Health Care Worker's Perception towards government's response towards COVID-19

Variable	Positive Freq (%)	Negative Freq(%)	X ²	p-value
Age group				
21 - 30	150 (62.1)	109 (27.1)	36.42	0.24
31 -40	245 (60.8)	114 (28.4)		
41-50	231 (57.4)	74 (28.3)		
51-60	240 (59.6)	117 929.3)		
>60	217 (53.8)	104 (35.8)		
Level of Education				
Postgraduate	99 (66.2)	21(13.7)	26.44	0.02*
Tertiary	121 (46.0)	47(18.6)		
Gender				
Female	154 (53.3)	71(45.8)	10.21	0.17
Male	67 (60.3)	19(17.1)		
Marital Status				
Single	57 (52.8)	34(31.4)	20.65	0.08
Married	156 (60.0)	45(17.2)		
Religion				
Christianity	189 (60.6)	65(20.8)	24.04	0.04*
Islam	13 (17.1)	25(32.9)		
Place of practice				
Private	24 (58.5)	7 (17.0)	413.07	0.00*
Public	197 (56.5)	80(23.7)		

There was a statistically significant association between socio-demographic characteristics and the perception of the healthcare workers to government's response towards COVID-19. Educational level (p=0.02), religion (p=0.04) and place of practice (p=0.00) positively influenced the perception of the healthcare workers towards government's response towards COVID-19.

DISCUSSION

Our study revealed that the HCWs had a good knowledge of the transmission, symptoms, prevention and complications of Covid-19. The high proportion of good knowledge among the HCWs could be as a result of the numerous sources of information available to the HCWs. Training sessions were also organized for the HCWs during the period of the pandemic. However, compared to a web-based study among HCWs conducted in the United Arab Emirates, a significant proportion (60%) of the respondents had poor knowledge of Covid-19 transmission.[17] Other studies conducted in Iran and Saudi Arabia on the knowledge, attitude and practices of HCWs during the first wave of the pandemic revealed a lower level of knowledge.[21,28,29] Another study conducted in Egypt revealed that the knowledge score was quit high with about 83.1% reporting of being afraid of getting infected and transmitting the virus to their families.[30]

Our study reported that majority of the HCWs disagreed with drinking alcohol, spraying chlorine, taking antibiotics and chloroquine to prevent Covid-19 infection. This perception could be as a result of the exposure to numerous sources of information on the pandemic as well as the training received. This finding was similar to the findings of a study conducted among the HCWs revealed that the perception of the HCWs toward Covid-19 was considered to be positive.[17,25]

Gender, marital status and occupational status were associated with the perception of the HCWs toward government's response to Covid-19 in our study. This was similar to the findings of some previous studies regarding SARS and Covid-19 in China.[3,31] This finding could be due to the similar demographic characteristics in the study populations.

Our study reported that more than half of the HCWs disagreed that adequate laboratory support was provided, adequate welfare of the people as well as that of the health workforce. The reason could be due to the limited number of laboratory facilities for COVID-19 diagnosis during the early phase of the outbreak and also due to the lockdown, HCWs and even the people could not access social and welfare services. Similarly, more than half of the healthcare workers disagreed that the government's response to COVID-19 was well coordinated. This could be due to the novel nature of COVID-19 as well as the numerous communication channels during the early phase of the outbreak. The Presidential Task Force on COVID-19, Lagos State Emergency Operations Centre as well as the social media dishing out several and at times conflicting information on the curbing of COVID-19 outbreak. These findings were similar to that of a study on the impact and government intervention strategies during the early phase of COVID-19 pandemic in Nigeria, which reported that the government interventions were considered insufficient.[34] The study reported that the HCWs workers disagreed with the mental and psychological care of the health workforce and the people. Similarly, a review of literature on the mental and psychological well-being of the health workforce during the pandemic reported substantial limitations in response capacity. REF HCWs caring for the COVID-19 patients were stressed, had physical exhaustion, separated from family, had fear of stigma and pain of losing patients and colleagues.[34]

Similarly, a qualitative study in Nigeria on the preparedness of the healthcare facilities for outbreak of communicable diseases revealed that healthcare facilities were insufficiently equipped to respond to outbreaks. None of the healthcare facilities had an emergency operation unit.[35]

Furthermore, according to the Human Rights Watch, the spread of COVID -19 revealed the harmful impact of insufficient healthcare investment by African governments, including inadequate supplies of personal protective equipment for healthcare workers.[36]

CONCLUSION AND RECOMMENDATIONS

The knowledge of COVID-19 among the healthcare workers was good, however, their perception towards government's response COVID-19 was considered to be negative. With the pandemic still on the rise, government and other relevant stakeholders should take health and other essential workers lives seriously. More investment should be focused more on the health systems, strengthen Primary Health Care to respond to subsequent epidemics and engender confidence among the healthcare workers.

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. COVID-19 Resources and alerts. American College of Health Association (ACHA). COVID-19 Resources and alerts. <https://www.acha.org/COVID-19>. Date Accessed on 12 April, 2020.
2. Lin Y, Wunderink RG. Middle Easy Respiratory Syndrome (MERS), Severe Acute Respiratory Syndrome (SARS) and other coronaviruses as cause of pneumonia. *Respirology*. 2018;23(2):130-137.
3. Li Q, Guan X, Wu P, Wan X, Zhou L, Tong Y *et al*. Early transmission dynamics of Wuhan, China of novel coronavirus-infected pneumonia. *New Engl. J. Med*. 2020;382(13):1199-1207.
4. Eurosuveillance Editorial Team. Note from the editors. World Health Organization declares novel coronavirus (2019-nCoV) sixth Public Health Emergency of International Concern. *Euro surveill*. 2020;25(5): 200/3/e.
5. <https://www.ncdc-gov-ng/disease/outbreak>. COVID-19 Outbreak in Nigeria. Situation report. Nigeria Centre for Disease Control March 9 2020. Accessed on 12 April 2020.
6. Cockburn S. <https://www.amnesty.org/en/latest/news/2020/amnesty-analysis-7000-health-workers-have-died-from-COVID-19>. Global: Amnesty analysis reveals over 7,000 health workers have died from COVID-19. Date Accessed: 23 February 2020
7. Hakan Erdem, Daniel R Lucey. Healthcare Workers Infections and Deaths due to COVID-19: A survey from 37 nations and a call for WHO to post national data on their website. *International Journal of Infectious Diseases*. 2021;102:239-241.
8. Haseltine WA. Nearly 300, 000 health care workers have been infected with COVID-19 worldwide, threatening health systems. <https://www.forbes.com/sites/williamhaseltine/2020/11/17/the-infection-of>

- hundreds-of-thousands-of-healthcare-workers-worldwide-poses-a-threat-to-national-health-systems/?sh=36efaa0f3499. Date Accessed: 16 December, 2020.
9. World Health Organization. Novel coronavirus (COVID-19) situation. <https://experience.arcgis.com/experience/685/doace521648f8a5beee/b9125> Date Accessed on 12 April, 2020.
10. Coronavirus disease (COVID-19). www.who.int/emergencies/diseases/novel-coronavirus-19. Date Accessed 29 November, 2020
11. <https://www.ncdc.gov.ng>. Weekly Epidemiological Report. Nigeria Centre for Disease Control. Date Accessed: 22 April, 2020
12. Wu Z, McGrogan JM. Characteristics of and important lessons Coronavirus Disease 2019 (COVID-19) outbreak in China. Summary of a Report of 72,314 cases from the Chinese Center for Disease Control and Prevention. JAMA. 2020;323(13):1239-1242.
13. Welle D. Coronavirus latest: WHO says health workers account for 10% of global infections. <https://www.dw.com/en/coronavirus-latest-who-says-health-workers-account-for-10-of-global-infections/a-54208221>. Date Accessed: 16 December, 2020.
14. [https://doi.org/10.1016/S0140-67369\(20\)306449](https://doi.org/10.1016/S0140-67369(20)306449). COVID-19: Protecting health care workers. Lancet. 2020;395(10228):922.
15. <https://www.who.int/emergencies/disease-novel-coronavirus-2019-situation>. World Health Organization (WHO). Novel Coronavirus 2019 (n-CoV) Situation reports 2020. Date Accessed: 12 April, 2020.
16. Giuffrida A, Tondo L. As if a storm hit: more than 40 Italian workers have died since crisis began. <https://www.theguardian.com/world/2020/mar/26/as-if-a-storm-hit-33-italian-health-workers-have-died-since-crisis-began>. Date Accessed: 12 April, 2020.
17. Mohammed Ikmal, Surdanshan Pandel, Ya-vei Chia, Chinenyen Nwoke, Sharuk Khan, Mohammed Amin Bahram et al. Knowledge and Perception of COVID-19 among Health Care Workers: Cross sectional Study. JMIR Public Health Surveill. 6(2); e19160.
18. www.COVID-19.who.int/table. Date Accessed: 22 February, 2021
19. <https://www.ncdc.gov.ng/disease/outbreak>. Date Accessed 22 April, 2020.
20. <https://www.newsweek.com>. Date Accessed 22 April, 2020
21. Taghrir MH, Borazjani R, Shiraly R. COVID-19 and Iranian Medical Students: A survey on their related-knowledge, preventive behaviour and risk perception. Arch Iran Med. April 2020. 23(4): 249-254
22. Ogolodom MV, Mbaba AN, Alazigba N, Erondo OF, Egbe NO, Golden I et al. Knowledge, Attitudes and Fears of healthcare workers towards the Corona Virus Disease (COVID-19) pandemic in South-South, Nigeria. Health Sci. J Sp. 2020;1:002. <http://www.hsj.gr/>. DOI: 10.36648/17991-8109X.SI.002. Date Accessed: 20 May 2020.
23. Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, et al. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. International Journal of Biological Sciences. 2020;16(10):1745-52. Epub 2020/03/15
24. Van den Berg RG. SPSS Tutorials. <https://www.spss-tutorial.com>. Date Accessed: 27 November, 2020.
25. www.reliefweb.int/sites/reliefweb/int/files/resources/health-worker-s-perception-survey-final-20052020. Raghavan V, Jabbrkhail N, Ahmady A. Knowledge, Perception and Practice survey of health workers in Eight provinces of Afghanistan. 2020. Date Accessed: 20 May 2020.
26. <https://www.wma-net/p>. WMA Declaration of Helsinki ethical principles for medical research involving human subjects. Date Accessed: April 22, 2020.
27. Eysenbach G. Improving the quality of Web-surveys, The checklist for reporting results of internet E-surveys (CHERRIES). J. med. Internet. Res. 2004;6(3):e34.
28. Khan MU, Shah S, Ahmad A, Fatokun O. Knowledge and attitude of healthcare workers about Middle East Respiratory Syndrome in multispecialty hospitals of Qassim, Saudi Arabia. BMC Public Health. 2014;14:1281. doi: 10.1186/1471-2458-14-1281.
29. Nour MO, Babilghith AO, Natto HA, Al-Amin FO, Alawneh SM. Knowledge, attitude and practices of healthcare providers towards MERS-CoV infection at Makkah hospitals, KSA. Int Res J Med Med Sci. 2015;3(4):103-12.
30. Wafaa YA, Enas MH, Mona IA, Nashwa SH. Assessment of Knowledge, Attitudes and Perception of Healthcare Workers Regarding COVID-19: A cross-sectional study from Egypt. J Community Health. 2020;(7):1-10. <https://doi.org/10.1007/s10900-020-00882-0>
31. Jiax JG, Tang XI, Li HW. Survey of knowledge of villagers in prevention and control of SARS in Hainan Province. J China Tropical Medicine. 2005;4:124-130.
32. WHO COVID-19 Preparedness and Response Report. 1 February to 30 June 2020. www.who.int/publication. who.covid-19-preparedness-and-response-progress-report. Date Accessed: 1 December, 2020.
33. <https://www.lsmoh.com-covid-19-lagos-state-response>. Date Accessed: 1 December, 2020
34. Doherty FV, Odeyemi OA, Adeoki A, Amolegbe O and Ajagbe FE. Evaluation of knowledge, impacts and government interventions strategies during the COVID-19 pandemic in Nigeria. Data Brief. 2020;32:106177. DOI: <https://doi.org/10.1016/j.dib.2020.106177>.
35. Ughasoro MD, Esangbedo DO and Udorah IM. Health Care Workers perspectives on preparedness of healthcare facilities for outbreak of Community Diseases in Nigeria: A Qualitative Study. Am. J. Trop. Med. Hyg. 2019;100(4):1022-1028. DOI: 10.4269/ajtmn.18-0404. <https://www.hrw.org/news/2020/06/08/africa-covid-19-exposes-healthcare-shortfalls>. Africa: COVID-19 exposes healthcare Shortfalls: Prioritize Investment to Improve Access to Call for All. Date Accessed: 22nd February, 2021