

Epidemiological Study on Knowledge, Attitude and Practices towards Covid-19 among Health Care Workers at Infectious Diseases Hospital Kano, Nigeria

Ahmad Salisu Aliyu¹, Ahmed Habibu Badawi¹, Nuru Yakubu Umar², Dalhatu Umar³, Hussaini Mohammed³

¹Medical Laboratory Department Infectious Diseases Hospital (IDH) Kano, Nigeria

²College of Nursing and Midwifery, Bauchi State, Nigeria

³College of Nursing Sciences, Abubakar Tafawa Balewa University Teaching Hospital Bauchi, Bauchi State, Nigeria

***Corresponding Author:** Ahmad Salisu Aliyu, Medical Laboratory Department Infectious Diseases Hospital (IDH) Kano, Nigeria, **E-mail:** salisuahmadaliyu@yahoo.com

Abstract

Background: An emerging respiratory disease was abbreviated as COVID 19, after it has been first reported in December 2019 in Wuhan city of China. The virus is zoonotic which has a tendency to be transmitted between animal to human and human to human. On January 30, 2020, the World Health Organization (WHO) declared Coronavirus Disease 2019 (COVID-19) a public health emergency of international concern. Consequently, on March 11, 2020, the World Health Organization (WHO) declared that COVID-19 is a pandemic disease. As of March 12, 2020, more than 125,000 confirmed cases across 118 countries and over 4600 deaths had been reported. Thus this study aims at assessing the Knowledge, Attitude and Practices (KAPs) toward COVID-19 among Health Care Workers (HCWs) at Infectious Diseases Hospital (IDH) Kano, Nigeria.

Methodology: A facility based cross-sectional study was conducted at Infectious Diseases Hospital (IDH) Kano, Nigeria from July, 2020 to August, 2020. Socio-demographic data were collected by using a semi-structured questionnaire. Descriptive analysis was performed to obtain the frequency distribution of the variables. **Results:** The result shows that 150 participants responded to the questionnaire. 110 respondents (73.3%) were male and the remaining 40 (26.7%) were female. Regarding knowledge, 149(99.3%) had good knowledge, concerning Attitude, 80(53.3%) had positive attitude and regarding Practices, 150 (100%) had good practices toward COVID-19.

Conclusion: The study revealed that the respondents have good knowledge and practices towards COVID-19. However, the perception status of the respondents towards COVID-19 was low. Strategies for enhancing the capacity of healthcare workers to develop good attitude are needed. Continue professional training on education is advised among Health Care Workers (HCWs) in Kano, Nigeria to improve knowledge of Health Care Workers (HCWs) hence averting negative attitudes and promoting positive preventive and therapeutic practices. Follow up studies involving teaching and non-teaching hospitals across the country is recommended.

Keywords: COVID-19, KAPs, Health Care Workers, Infectious Diseases Hospital, Kano, Nigeria

1. INTRODUCTION

Corona virus Disease 2019 also known as COVID-19 is currently a global health threat and public health emergency of international concern [1]. Coronavirus disease 2019 (COVID-19) is an emerging respiratory disease caused by a single-strand, positive-sense ribonucleic acid (RNA) virus, severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) virus [2].

COVID-19 was first reported in December 2019 among patients with viral pneumonia symptoms in Wuhan, China [3, 4]. They were found to be related with the Huanan seafood market in Wuhan, in the Hubei province of China, where other non-aquatic animals were also being sold before the outbreak [5]. As of 20th April 2020, over 2.4 million cases and 165,000 deaths have been reported globally [6, 7]. Europe is the most

affected with over 50% of cases and 60% of deaths reported in this region [8]. United States of America has the highest number of cases globally (695,350 cases) and the highest number of deaths (32,427 deaths) [8]. African region is the least affected with 13,892 cases and 628 deaths, but the numbers are increasing [8]. It is distinct from other severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS) and influenza [9, 10]. In the past two decades more than 10, 000 cumulative cases, with mortality rates of 10% for SARS-CoV and 37% for MERS-CoV happened Worldwide [11, 12]. The major route of transmission of COVID-19 is spread by human-to-human transmission through droplet, feco-oral, and direct close contact [13]. This viral infection causes several diseases; respiratory, enteric, hepatic, neurologic, and vascular system [14, 15]. Individuals with confirmed severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) have clinical symptoms of fever, cough, and shortness of breath with an incubation period of 14 days following exposures to the virus [16-21]. This COVID-19 causes morbidity in the range of mild respiratory illness to severe complications characterized by acute respiratory distress syndrome, septic shock, and other metabolic and hemostasis disorders and death [22, 23, and 24]. Most of the fatal cases and severe illnesses like acute respiratory distress syndrome (ARDS) occurred in older adults and people who have underlying medical comorbidities like diabetes, cancer, hypertension, heart, lung, and kidney diseases [25, 26, 27] . A systematic review on COVID-19 patients showed that individuals with hypertension, diabetes, cardiovascular and respiratory system diseases were the most vulnerable groups [28]. Chronic obstructive pulmonary disease patients have a five-fold increased risk of severe COVID-19 infection [29].

The highly contagious characteristics of COVID-19 makes it harsher and dangerous, and causes a high fatality rate and rapid spread of the viruses from China to more than 210 countries around the world, including Nigeria. Consequently, on March 11, 2020, the World Health Organization (WHO) declared that COVID-19 is a pandemic disease [30]. Furthermore, the disease significantly affects everyday life, resulting in a socio-economic crisis [31].

So far, no successful anti-viral treatment or vaccine has been reported. Therefore, applying

the preventive measure to control COVID-19 infection is the utmost critical intervention [32]. Controlling the pandemic by arresting its transmission to save millions of lives demands multipronged strategies with key methods like nationwide lockdown, contact tracing, keeping distance and enhancing quarantine arrangements for people at risk of infection. Accordingly, many countries across the globe tried it by taking different interventions including nationwide lockdown, varying levels of contact tracing and self-isolation or quarantine, and promotion of public health measures including hand washing, respiratory etiquette, and social distancing. However, the spread of COVID-19 is still alarmingly increasing from day to day and not controlled. Poor understanding of the disease among the community, especially the high-risk groups is implicated for this increase in the spread of the infection and death toll. Therefore, successfully control and minimization of morbidity and mortality due to COVID-19 require changing the behavior, which is influenced by people's knowledge and perceptions, of the general public, especially the high risk groups [33].

A report from seven COVID-19 patients shows 79.5% genome sequence identity to SARS-CoV with a reported biological and epidemiological difference from SARS-COV [34, 35] .The virus has been declared as a pandemic on March 11, 2020, by WHO after 11 days of being declared as a public health emergency [36, 37]. With a global rise in a number of confirmed cases and death across the world, little is known about the epidemiology, pathophysiology, prevention, and treatments of COVID-19.

The global community Research and Development Blueprint Scientific Advisory Group acknowledged the research gaps in COVID-19. Awareness creation and changing attitude were among the public health intervention recommended by World Health Organization. Various literatures have shown Demographic, Social and technological factors were known to affect the level of knowledge, attitude, and practice toward disease and its prevention [38]. Health care professionals are expected to be high risk for COVID-19 because of contact with confirmed and suspected cases at a frontline.

With the widespread disruptive effects of COVID-19, different countries have been taking different prevention and control measure like

quarantining, closing and suspension of transportations, avoiding public gatherings and even holding different public service works including education. Because of the above-mentioned measures students, workers, tourists and others have been now prevented from accessing their training institutions, workplaces, and homes [39-42]. Psychological symptoms like anxiety/stress, panic buying, fear and paranoia about attending community events; and reduced autonomy and concerns about income, job, and security have already been observed on a population. Such as being at home can place children at increased risk of, or increased exposure to, child protection incidents or make them witness to interpersonal violence if their home is not a safe place [42]. Coronavirus pandemic fears prompt Government to activate emergency response and extend travel ban [42]. In addition to the community members, health care providers are also at risk of higher psychological distress due to longer working hours and high risk of exposure to the virus. This may also lead to stress, anxiety, burnout, depressive symptoms, and the need for sick or stress leave, which would harm the capacity of the health system to provide services during the crisis [43]. Even though the psychological impact of the coronavirus disease (COVID-19) pandemic must be recognized alongside the physical symptoms, the global response is a simple public health strategy such as hand washing, quarantine and social distancing [44, 45]. If left untreated, these psychological symptoms may have long-term health effects health workers and require treatment adding to the cost burden of managing the illness [46-49].

In Nigeria the first COVID-19 case has been confirmed on 27 February, 2020. Nigeria confirmed its first case in Lagos State, an Italian citizen who works in Nigeria had returned on 25 February from Milan, Italy through the Murtala Muhammed International Airport, fell ill on 26 February and was transferred to Lagos State biosecurity facilities for isolation and testing [39, 40]. Recently COVID-19 cases in Nigeria are around 44,129 and are reported 896 deaths [41]. Health Care Workers (HCWs) are at the frontline of COVID-19 pandemic response and are exposed to dangers like pathogen exposure, long working hours, psychological distress, fatigue, occupational burnout and stigma, and physical violence [50-52]. A poor understanding of the disease among HCWs can result in delayed identification and treatment leading to

rapid spread of infections. Over 100 Health Care Workers (HCWs) have lost their lives to COVID-19, a tragedy to the world and a barrier to fight against the disease [53]. Guidelines for Health Care Workers and online refresher courses have been developed by World Health Organization (WHO), Center for Disease Control (CDC) and various governmental organizations in various countries to boost the knowledge and prevention strategies [54]. There is paucity of literature on Knowledge Attitude and Practices (KAPs) of Health Care Workers (HCWs) toward the COVID-19 pandemic. However, a study with majorly Asian Health Care Workers (HCWs) and medical students revealed that they had insufficient knowledge about COVID-19 but had a positive attitude toward prevention of COVID-19 transmission [55]. In Nigeria, the Federal Ministry of Health has initiated training for healthcare workers (HCWs) at different levels though an effort to cover a wider range is poor. The World Health Organization (WHO) and Center for Disease Control (CDC) also initiated a multidisciplinary approach to tackle COVID-19 of which awareness creation is the main. Knowledge, Attitude and Practices of Health Care Workers toward COVID-19 and its prevention techniques have a pivotal impact in fighting against the disease. To our knowledge, no study has been done in Kano, Nigeria to assess Knowledge Attitude and Practices (KAPs) towards COVID-19 specifically among Health Care Workers (HCWs). Thus this study aims at assessing the Knowledge, Attitude and Practices (KAPs) toward COVID-19 among Health Care Workers (HCWs) at Infectious Diseases Hospital (IDH) Kano, Nigeria.

2. METHODOLOGY

2.1. Study Area and Study Design

The study was conducted at Infectious Diseases Hospital (IDH) Kano, Nigeria. Infectious Diseases Hospital (IDH), Kano is a government owned specialized secondary health facility serving a population of about 1.5 million and having a patronage of about 300/day. It is a referral centre located along France road in Kano metropolis. The hospital caters for all infectious diseases' cases such as HIV, TB, gastroenteritis, cholera, etc. A facility-based cross-sectional study was conducted using interviewer-administered questionnaire from July, 2020 to August, 2020.

2.2. Sample Size Determination

In this study, manual calculation of the sample size using Morgan and Krejcie (1970) formula was used for sample size determination as stated below:

$$S = \frac{X^2NP(1-P)}{d^2(N-1) + X^2P(1-P)}$$

Where:

S = required sample size

X² = the table value of the chi-square at desired confidence (3.841)

N = Study Population size (248)

P = Population proportion assumed to be 0.50 since this would provide maximum sample size

d² = Degree of accuracy of the result expressed as proportion 0.050

$$\frac{3.841 \times 248 \times 0.5 \times 0.5}{0.0025 \times 247 + 3.841 \times 0.5 \times 0.5}$$

$$\frac{238.142}{1.57775} = 150$$

Hence 150 respondents

2.3. Inclusion and Exclusion Criteria

Health Care Workers who were aged 18 years and above were included in the study after an informed consent. Health Care Workers (HCWs) who were too ill to participate were excluded.

2.4. Data Collection

Data was collected from eligible and willing participants using a pre-tested, structured questionnaire. Socio-demographic information including age, gender, occupation, education and socio-economic status were collected. The knowledge of the participants on symptoms suggestive of COVID-19 causes of COVID-19, treatment and preventive measures, regarding COVID-19 was also collected.

Table1: Socio demographic characteristics of respondents (n=150)

Characteristics	Frequencies	Percentages (%)
Gender		
Males	110	73.3
Females	40	26.7
Ages		
20-25	37	24.7
26-30	36	24
31-35	43	28.6
36+	34	22.7
Marital status		
Married	95	63.3

2.5. Data Analysis

Data were analyzed using Statistical Package for Social Science (SPSS) software version 16.0 at that time with the help of the Statistician. The descriptive statistical method was used to analyze frequencies and percentages.

2.6. Ethical Considerations

This study was conducted only after obtaining approval from research ethics committee of the hospital.

3. RESULTS

A total of 150 Health Care Workers (HCWs) were interviewed, giving 100% response rate. Of the study subjects, 110 (73.3%) and 40 (26.7%) were males and females respectively. Among all, 43 (28.6%) of Health Care Workers were 31-35 years of age. 95 (63.3%) of Health Care Workers were married, 40 (26.7%) were currently single, 10 (6.7%) divorced, and 5 (3.3%) Health Care Workers were widowed (Table 1). Of the 150 participants, majority 55 (36.7%) had diploma, 40 (26.7%) had certificate, 30 (20%) had higher national diploma, 20 (13.3%) had bachelor’s degree and a minority 5 (3.3%) had master’s degree. The socio-economic characteristics of the study showed that, among all Health Care Workers, nurses constituted the majority of participants 38 (25.3%) and 115(76.7%) of respondents had over five years working experience. With regards to the sources of information on COVID-19 majority 38 (25.3%), 37 (24.7%), 34 (22.7%) and 30 (20%) of the study subject reported that they got information on COVID-19 from International health organization e.g., WHO, Government sites and media e.g., NCDC, MoH-Kano, News media e.g., TV, radio, newspaper and Social media e.g., WhatsApp, Face book (Table 1).

Single	40	26.7
Divorced	10	6.7
Widowed	5	3.3
Level of education		
Bachelors	20	13.3
Masters	5	3.3
Higher National Diploma	30	20
Diploma	55	36.7
Certificate	40	26.7
Profession		
Medical doctors	5	3.3
Medical lab scientist	34	22.7
Nurses	38	25.3
Pharmacist	36	24
Primary health care	37	24.7
Working Experience		
Five years or less	35	23.3
Over 5 years	115	76.7
Source of Information on COVID-19		
Government sites and media e.g., NCDC, MoH-Kano	37	24.7
News media e.g., TV, radio, newspaper	34	22.7
International health organization e.g., WHO	38	25.3
Social media e.g., WhatsApp, Face book	30	20
Journals	5	3.3
Others	6	4

3.1. Knowledge of Respondents towards COVID-19

From a total of one hundred and fifty (150) respondents' majority 149(99.3%) of the study participants reported that main clinical symptoms of COVID-19 are fever, cough, shortness of breath, and fatigue. 147(98%) of the study subject have reported that the COVID-19 viruses spreads via respiratory droplets of infected individuals through the air during sneezing or coughing of infected patients. However, among the total (150) respondents, most 149(99.3%) of the study participants know that COVID-19 symptoms appear within 2–14 days. 147(98%) study participants reported that currently, there is no effective treatment or vaccine for COVID-2019, but early symptomatic and supportive treatment can help most patients to recover from the infection. 145(96.7%) and 140(93.3%) of the study

participants were reported that touching an object or surface with the virus on it, and then touching your mouth, nose, or eyes with the unwashed hand and touching or shaking hands of infected person would result in the infection by the COVID-19 virus. Frequent proper hand washing with soap for 20 seconds was reported as one major means of protection by 150(100%) participants.

Most 145(96.7%) of the study participants reported that avoiding of going to crowded places prevents the spread of infection. One hundred and fourty seven participants (98%) reported that it is necessary to wear a mask when moving out of the home to prevent the infection of COVID-19. Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus was reported by 150(100%) of the study subject (Table 2).

Table2: Knowledge of the respondents towards COVID-19 (n=150)

S/N	Characteristics	Yes (%)	No (%)
1	Main clinical symptoms of COVID-19 are fever, cough, shortness of breath, and fatigue	149(99.3%)	1(0.7%)
2	Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19 virus	125(83.3%)	25(16.7%)
3	The COVID-19 viruses spreads via respiratory droplets of infected individuals through the air during sneezing or coughing of infected patients	147(98%)	3(2%)
4	COVID-19 symptoms appear within 2–14 days	149(99.3%)	1(0.7%)
5	Currently, there is no effective treatment or vaccine for COVID-2019, but early symptomatic and supportive treatment can help most patients to recover from the infection	147(98%)	3(2%)

Epidemiological Study on Knowledge, Attitude and Practices towards Covid-19 among Health Care Workers at Infectious Diseases Hospital Kano, Nigeria

6	Not all persons with COVID-19 will develop severe cases. Those who are elderly, have chronic illnesses, and with suppressed immunity are more likely to be severe cases	129(86%)	21(14%)
7	Persons with COVID-19 cannot infect the virus to others if he has no any symptom of COVID-19	11(7.3%)	139(92.7%)
8	Touching an object or surface with the virus on it, and then touching your mouth, nose, or eyes with the unwashed hand would result in the infection by the COVID-19 virus	145(96.7%)	5(3.3%)
9	Touching or shaking hands of an infected person would result in the infection by the COVID- 19 virus	140(93.3%)	10(6.7%)
10	Wearing masks when moving out of home is important to prevent the infection with COVID-19 virus	147(98%)	3(2%)
11	Children and young adults do not need to take measures to prevent the infection by the COVID-19 virus	139(92.7%)	11(7.3%)
12	Washing hands frequently with soap and water for at least 20 seconds or use an alcohol based hand sanitizer (60%) is important to prevent infection with COVID-19	150(100%)	0(0%)
13	To prevent the COVID-19 infection, individuals should avoid going to crowded places such as public transportations, religious places, Hospitals and Workplaces	145(96.7%)	5(3.3%)
14	Traveling to an infectious area or having contact with someone traveled to an area where the infection present is a risk for developing an infection	149(99.3%)	1(0.7%)
15	People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place.	147(98%)	3(2%)
16	Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus	150(100%)	0(0%)

3.2. Attitude of Respondents towards COVID-19

Being infected with COVID 19 is very easy as reported by 90(60%) of the study subject.

The majority 80(53.3%) of the study participants perceived that washing hands frequently for 20 seconds with soap or using sanitizer is very easy. Avoiding; touching face

with the unwashed hand, shaking others, and attending in a crowded population were considered easy by 69 (46%), 75 (50%), and 60 (40%) respondents, respectively. More than half 115(76.7%) of the study participants perceived that practicing physical distance is very difficult. Staying at home to minimize the risk of infection is very easy as reported by 75 (50%) of the study subject (Table 3).

Table3: Attitude of the respondents towards COVID-19 (n=150)

S/N	Characteristics	Very Easy (%)	Easy (%)	Difficult (%)
1	Being infected with COVID 19 to you is	90(60%)	40(26.7%)	20(13.3%)
2	Washing hands frequently for 20 seconds with soap or using sanitizer is	80(53.3%)	60(40%)	10(6.7%)
3	Avoiding touching face with unwashed hands	56(37.7%)	69(46%)	25(16.7%)
4	Avoiding shaking others	55(36.7%)	75(50%)	20(13.3%)
5	Avoiding attending in a crowded population	50(33.3%)	60(40%)	40(26.7%)
6	Practicing physical distancing	15(10%)	20(13.3%)	115(76.7%)
7	Listening and following the direction of state and local authorities	71(47.3%)	70(46.7%)	9(6%)
8	Covering mouth or nose during a cough or sneeze with elbow/a tissue	50(33.3%)	60(40%)	40(26.7%)
9	Avoiding close contact with sick people	70(46.7%)	65(43.3%)	15(10%)
10	Using a mask when leaving home	55(36.7%)	75(50%)	20(13.3%)
11	Isolating oneself, if get sick to avoid the spread	85(56.7%)	45(30%)	20(13.3%)
12	Staying at home to minimize the risk of infection	75(50%)	40(26.7%)	35(23.3%)

3.3. Practice of Respondents towards COVID-19

One hundred and fifty (100%) study participants reported that they washed their hands with soap frequently. The majority 130(86.7%) of the respondents eat or drink in bars and restaurants. 65(43.3%) of the study participants used face

mask during leaving their home. 92 (61.3%) of the study subject participate in meetings, religious activities, events, and other social gatherings or any crowded place in areas with ongoing community transmission. Limit contact such as handshakes was reported by 73 (48.7%).

20(13.3%) of the study subject was reported to reuse a mask (Table 4).

Table4: Practices of the respondents towards COVID-19 (n=150)

S/N	Characteristics	Yes (%)	No (%)
1	Do you touch your eyes, nose, and mouth frequently with unwashed hands?	0(0%)	150(100%)
2	Do you wash your hands with soap and water frequently for at least 20seconds or use sanitizer/60% alcohol	150(100%)	0(0%)
3	Do you practice “physical distancing” by remaining 6 feet/2 meters away from others at all times?	85(56.7%)	65(43.3%)
4	Do you participate in meetings, religious activities, events, and other social gatherings or any crowded place in areas with ongoing community transmission?	92(61.3%)	58(38.7%)
5	Do you clean and disinfect frequently touched objects and surfaces	85(56.7%)	65(43.3%)
6	Do you cover your nose and mouth during coughing or sneezing with the elbow or a tissue, then throw the tissue in the trash	90(60%)	60(40%)
7	Do you stay home when you were sick due to common cold-like infection during the transmission period	150(100%)	0(0%)
8	Do you prefer to stay at home, in a room with the window open during the transmission period	125(83.3%)	25(16.7%)
9	Do you listen and follow the direction of your state and local authorities?	140(93.3%)	10(6.7%)
10	Do you eat or drink in bars and restaurants?	130(86.7%)	20(13.3%)
11	Do you limit contact (such as handshakes?)	73(48.7%)	77(51.3%)
12	Do you use other workers’ phones, desks, offices, or other work tools and equipment?	92(61.3%)	58(38.7%)
13	In recent days, have you worn a mask when leaving home?	65(43.3%)	85(56.7%)
14	If yes, do you touch the front of the mask when taking it off?	95(63.3%)	55(36.7%)
15	Do you reuse a mask?	20(13.3%)	130(86.7%)

4. DISCUSSION

Currently, the alarmingly spread of COVID-19 is a major public issue in the world. So far no treatment or vaccine is discovered to it. Therefore, prevention is the best solution. Effective prevention and control of COVID-19 is achieved through increasing the populations’ especially high-risk groups’ knowledge, attitude, and practice towards COVID-19.

COVID-19 is an emerging, rapidly changing global health challenge affecting all sectors [50, 51]. Health Care Workers (HCWs) are not only at the forefront of the fight against this highly contagious infectious disease but are also directly or indirectly affected by it and the likelihood of acquiring this disease is higher among Health Care Workers (HCWs) compared to the general population [44]. It is therefore of paramount importance that Health Care Workers (HCWs) across the world have adequate knowledge about all aspects of the disease from clinical manifestation, diagnosis, proposed treatment, and established prevention strategies.

To the best of our knowledge, this is the first study in Kano, Nigeria to assess the Knowledge Attitude and Practices (KAPs) of Health Care Workers (HCWs) toward COVID-19. There are also very limited studies that document Knowledge Attitude and Practices (KAPs) among Health Care Workers (HCWs) globally.

4.1. Knowledge

In the present study, we were able to demonstrate that generally the Health Care Workers (HCWs) had sufficient knowledge about COVID- 19. Among these Health Care Workers (HCWs), the level of knowledge about COVID-19 was similar irrespective of the age, sex, academic qualification or profession of the Health Care Workers (HCWs). Generally, majority of the Health Care Workers (HCWs) had sufficient knowledge about COVID-19 which is in line with findings in Vietnam about COVID-19 [52]. In contrast, it is conflicting to surveys by Bhagavathula et al. on COVID-19 [46] , a baseline study among nurses in Gabon on Ebola [53] and Health Care Workers (HCWs) in Ethiopia on Ebola [54] who all reported poor knowledge. From our study, 149(99.3%) of Health Care Workers (HCWs) had sufficient knowledge about COVID-19 which is higher than values reported by Huynh et al. where 88.4% had sufficient knowledge on COVID-19 [52]. Further education and training through continuous professional education and journal clubs, particularly on symptoms and transmission are essential in improving the knowledge of Health Care Workers (HCWs) about COVID-19 in our setting.

In our study, most of the participants used information from international and governmental media (websites and verified social media pages). Our study suggests that knowledge on

COVID-19 was significant among Health Care Workers (HCWs) who used news media such as televisions. This suggests that such media should be frequently used to disseminate information on COVID-19 by the stakeholders. Younger Health Care Workers (HCWs) (<35 years) were more likely to have knowledge about COVID-19 unlike in Vietnam where age did not predict knowledge [52]. This age difference may be partly due to the diversity of the sources of information frequently used by younger Health Care Workers (HCWs).

4.2. Attitude

Our present study reveals that majority of Health Care Workers (HCWs) at Infectious Diseases Hospital (IDH) Kano, Nigeria have a negative attitude toward COVID-19 in which about 115(76.7%) reported that physical distancing was difficult which is in congruence with a Knowledge Attitude and Practices (KAPs) study on Ebola in Ethiopia among Health Care Workers (HCWs) [54] but in contrast to Giao's study on COVID-19 [52]. Being infected with COVID-19 virus was highly threatening for nearly half of the study participants in this study. This is not in line with the study done in Chicago, USA, where only 24.6% of respondents get highly worried about being infected with COVID-19[56]. This difference might be due to the difference in study population's awareness on COVID-19. However, attitude was not significantly determined by knowledge.

4.3. Practices

Our study shows that Health Care Workers (HCWs) at Infectious Diseases Hospital (IDH) Kano, Nigeria have good COVID-19 prevention practices similar to findings by Alfahan et al. on coronaviruses [55], Raab et al. on Ebola Virus Disease in Guinea [57] and in the general population of the Chinese on COVID-19 (19). Majority of the Health Care Workers (HCWs) are following infection prevention and control practices recommended by the Federal Ministry of Health Nigeria and World Health Organization (WHO). These include regular hand hygiene, wearing a face mask when in high risk situations and isolation. 90(60%) of Health Care Workers (HCWs) reported that covering

nose and mouth during coughing or sneezing with the elbow or a tissue then throw the tissue in the trash. These are very vital practices to prevent transfer of COVID-19 from patients to patients and to the Health Care Workers (HCWs) themselves.

4.4. Limitations

Our study has some limitations. Firstly, no standardized tool for assessing Knowledge Attitude and Practices (KAPs) on COVID-19 has been previously validated. We have however adapted and modified a previously published tool for assessment of Knowledge Attitude and Practices (KAPs) toward prevention of respiratory tract infections; and a tool used to assess Knowledge Attitude and Practices (KAPs) among Chinese residents [48, 49]. The questions have been formulated from WHO and CDC guidelines and reports on COVID-19 [47]. Secondly, only Health Care Workers (HCWs) at Infectious Diseases Hospital (IDH) Kano, Nigeria were surveyed and the results of this study may not reflect the Knowledge Attitude and Practices (KAPs) of Health Care Workers (HCWs) in the entire country. However, this is the first study to assess Knowledge Attitude and Practices (KAPs), can be used to formulate targeted Continuing Medical Education (CME) for Health Care Workers (HCWs) and enrolled in a countrywide survey and training on COVID-19. A similar study may be extended to the community.

5. CONCLUSION

In conclusion, we found that majority of Health Care Workers (HCWs) at Infectious Diseases Hospital (IDH) Kano, Nigeria have sufficient knowledge on the transmission, diagnosis and prevention of the transmission of COVID-19. Knowledge on COVID-19 was significantly higher among Health Care Workers (HCWs) who used International health organization e.g., WHO and Government sites and media e.g., Nigeria Center for Disease Control (NCDC), Ministry of Health (MoH) Kano as well as news media such as televisions and newspapers and those aged 26–35 were more knowledgeable about COVID-19. There was no statistically significant difference in the level of knowledge about COVID-19 among health care workers in Kano, Nigeria irrespective of their professions or qualifications. About four-fifth of the respondents had negative attitude toward COVID-19 and just over 75% of the Health

Care Workers (HCWs) had good practices toward COVID-19 especially those aged 30 years or more. Strategies for enhancing the capacity of healthcare workers to develop good attitude are needed. Continued professional education is advised among Health Care Workers (HCWs) in Kano, Nigeria to improve knowledge of Health Care Workers (HCWs) hence averting negative attitudes and promoting positive preventive and therapeutic practices. We recommend follow up studies involving teaching and non-teaching hospitals across the country.

ACKNOWLEDGMENTS

We would like to acknowledge and thanks the study participants for kindly given us the required data.

REFERENCES

- [1] Wang C, Horby PW, Hayden FG, et al. A novel coronavirus outbreak of global health concern. *Lancet* (2020); 395(10223):470–73. [Published Online First: 2020/01/28] [https://doi.org/10.1016/S0140-6736\(20\)30185-9](https://doi.org/10.1016/S0140-6736(20)30185-9) PMID: 3198 6257
- [2] Masters PS. Coronavirus genomic RNA packaging. *Virology* (2019); 537(August):198–207. Doi: 10.1016/j.virol. (2019).08.031.
- [3] Huang C, Wang Y, Li X, et al. Articles clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet* (2020); 395(15):497–506. Doi: 10.1016/S0140-6736(20)30183-5
- [4] Chen N, Zhou M, Dong X, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet* (2020); 395(10223):5 07–513. Doi: 10.1016/S0140-6736(20)30211-7
- [5] Wang D, Bo H, Chang HFZX. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus–infected pneumonia in Wuhan, China. *JAMA* (2020); 323(11):1061–1069. Doi: 10.1001/jama.(2020).1585
- [6] Tong Y, Ph D, Ren R, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus–infected pneumonia. *N Engl J. (2020); 382 (13):1199–1207. Doi: 10.1056/NEJMoa2001316*
- [7] Chan JF, Yuan S, Kok K, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to person transmission: a study of a family cluster. *Lancet* (2020); 395 (10223):514–523. Doi: 10.1016/S0140-6736(20)30154-9.
- [8] Guan WJ, Ni ZY, Hu Y, et al. Clinical characteristics of 2019 novel coronavirus infection in China. *MedRxiv. (2020); 1.*
- [9] Huang I-C, Bailey CC, Weyer JL, Radoshitzky SR, Becker MM, Chiang JJ, et al. Distinct patterns of IFITM-mediated restriction of filoviruses, SARS coronavirus, and influenza A virus. *PLoS pathogens. (2011); 7(1).*
- [10] Guan W-j, Ni Z-y, Hu Y, Liang W-h, Ou C-q, He J-x, et al. Clinical characteristics of coronavirus disease 2019 in China. *New England Journal of Medicine* (2020).
- [11] Kern MJ. *Global Epidemics, Pandemics, Terrorism: Risk Assessment and European Responses. (2016).*
- [12] Nicholson F. *Infectious Diseases: The Role of the Healthcare Professional. Clinical Forensic Medicine: Springer; (2020). p. 343-92.*
- [13] Backer J, Klinkenberg D, Wallinga J. (2020). Incubation period of 2019 novel coronavirus (2019-nCoV) infections among travellers from Wuhan, China, 20–28 January (2020). *Euro Surveill* (2020); 25(5). [Doi: 10.2807/1560-7917.es.2020.25.5.2000062]
- [14] [Chan JF-W, Lau SK-P, Woo PC-Y. The emerging novel Middle East respiratory syndrome coronavirus: The “knowns” and “unknowns”. (2013); 112(7):372-81.
- [15] Zumla A, Chan JFW, Azhar EI, Hui DSC, Yuen K-Y. Coronaviruses — drug discovery and therapeutic options. *Nature Reviews Drug Discovery. (2016); 15(5):327-47.*
- [16] Guan W, Ni Z, Hu Y, et al. Clinical characteristics of coronavirus disease 2019 in China. *N Engl J Med. (2020) ; (2020):1–13. Doi: 10.1056/NEJMoa2002032.*
- [17] Murthy S, Gomersall CD, Fowler RA. Care for critically ill patients with COVID-19. *Clin Rev Educ. (2020); 1–2. Doi: 10.1001/jama (2020). 3633.*
- [18] Zhou F, Yu T, Du R, et al. Clinical course and risk factors for mortality of adult in patients with COVID-19 in Wuhan, China: a retrospective cohort study. *Lancet* (2020); 395(10229):1054–1062. Doi: 10.1016/S0140-6736(20)30566-3.
- [19] Wu C, Chen X, Cai Y, et al. Risk factors associated with acute respiratory distress syndrome and death in patients with coronavirus disease 2019 pneumonia in Wuhan, China. *JAMA Intern Med. (2020); 1:1–10. Doi: 10.1001/jama internmed (2020).0994.*
- [20] Yang J, Zheng Y, Gou X, Pu K, Chen Z. Prevalence of comorbidities in the novel Wuhan coronavirus (COVID-19) infection: a systematic review and meta-analysis. *Int J Infect Dis. (2020); 94:91–95. doi:10.1016/j.ijid.2020.03.017*
- [21] Lippi G, Henry BM. Chronic obstructive pulmonary disease is associated with severe coronavirus disease 2019 (COVID-19). *Respir*

- Med. (2020); 167(March):105941. doi:10.1016/j.rmed (2020).105941.
- [22] Weiss P, Murdoch DR. COVID-19: towards controlling of a pandemic. *Lancet* (2020); 6736(20):1015–1018. Doi: 10.1016/S0140-6736(20)30673-5
- [23] Qualls N, Levitt A, Neha Kanade NW-J. Community Mitigation Guidelines to Prevent Pandemic Influenza — United States. Vol. 66; (2017): (2017).
- [24] Baloch S, Baloch MA, Zheng T, Pei X. The coronavirus disease 2019 (COVID-19) pandemic. *J Exp Med.* (2020); 250:271–278. Doi: 10.1620/tjem.250.271. Correspondence.
- [25] Geldsetzer P. Knowledge and perceptions of coronavirus disease 2019 among the general public in the United States and the United Kingdom: a cross-sectional online survey. *Ann Intern Med.* (2020); (2020):1–14.
- [26] Zhou P, Yang X-L, Wang X-G, Hu B, Zhang L, Zhang W, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature* (2020); 579(7798):270-3.
- [27] Jiang S, Shi Z, Shu Y, Song J, Gao GF, Tan W, et al. A distinct name is needed for the new coronavirus. *The Lancet* (2020); 395 (10228): 949.
- [28] Note from the editors: World Health Organization declares novel coronavirus (2019-nCoV) sixth public health emergency of international concern. *Euro-surveillance* (2020); 25(5).
- [29] Bedford J, Enria D, Giesecke J, Heymann DL, Ihekweazu C, Kobinger G, et al. COVID-19: towards controlling of a pandemic. *The Lancet* (2020); 395(10229):1015-8.
- [30] Organization WH. Coronavirus disease 2019 (COVID-19): situation report, 67 (2020).
- [31] Barua S. Understanding Coronanomics: The economic implications of the coronavirus (COVID-19) pandemic (2020).
- [32] Khan N, Faisal S. Epidemiology of Corona Virus in the World and Its Effects on the China Economy. Available at SSRN 3548292 (2020).
- [33] Zhou X, Snoswell CL, Harding LE, Bambling M, Edirippulige S, Bai X, et al. The Role of Telehealth in Reducing the Mental Health Burden from COVID-19. *Telemedicine and e-Health.* (2020).
- [34] Smith EM. Ethnic minorities: Life stress, social support, and mental health issues. *The counseling Psychologist.* (1985); 13(4):537-79.
- [35] Thienemann F, Pinto F, Grobbee DE, Boehm M, Bazargani N, Ge J, et al. World Heart countries. *World Heart Journal.* (2020); 15(1): 23.
- [36] Home O, Series IS, Plan S. Bridging Science and Service: A Report by the National
- [37] Advisory Mental Health Council's Clinical Treatment and Services Research Work group (1999).
- [38] Dai Y, Hu G, Xiong H, Qiu H, Yuan X. Psychological impact of the coronavirus disease 2019 (COVID-19) outbreak on healthcare workers in China. *MedRxiv* (2020).
- [39] Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors associated with mental health outcomes among health care workers exposed to Coronavirus disease 2019. *JAMA network open.* (2020); 3(3):e203976-e.
- [40] Nigeria Centre for Disease Control (2020). *Ncdc.gov.ng. Archived from the original on 2 March (2020). Retrieved 8 March (2020).*
- [41] Odunsi, Wale (28 January 2020). "Coronavirus: Nigeria announces preventive measures, releases numbers". *Daily Post Nigeria.* Retrieved 10 March (2020).
- [42] [41]. First case of corona virus disease confirmed in Nigeria. Nigeria centre for disease control. 28 February (2020). Retrieved 10 march (2020).
- [43] Maclean, Ruth; Dahir, Abdi Latif (28 February 2020). "Nigeria Responds to First Coronavirus Case in Sub-Saharan Africa". *The New York Times.* Retrieved 10 March (2020).
- [44] World Health Organization. Coronavirus Disease (COVID-19) Outbreak: Rights, Roles and Responsibilities of Health Workers, Including Key Considerations for Occupational Safety and Health. (2020). Available online at: [www.who.int/publications-detail/coronavirus-disease-\(covid-19\)-outbreak-rights-roles-and-responsibilities-of-health-workers-including-key-considerations-for-occupational-safety-and-health](http://www.who.int/publications-detail/coronavirus-disease-(covid-19)-outbreak-rights-roles-and-responsibilities-of-health-workers-including-key-considerations-for-occupational-safety-and-health) (accessed April 05, 2020).
- [45] MedScape. In Memoriam: Healthcare Workers Who Have Died of COVID-19. (2020). Available online at: www.medscape.com/viewarticle/927976 (accessed April 06, 2020).
- [46] World Health Organization. Emerging Respiratory Viruses, Including COVID- 19: Methods for Detection, Prevention, Response and Control. (2020). Available online at: www.openwho.org/courses/introduction-to-ncov (accessed March 18, 2020).
- [47] Bhagavathula AS, Aldhaleei WA, Rahmani J, Mahabadi MA, Bandari DK. Novel coronavirus (COVID-19) knowledge and perceptions: a survey on healthcare workers. *medRxiv.* Preprint (2020). Doi: 10.2196/ 19160.
- [48] World Health Organization. Infection Prevention and Control during Health Care
- [49] Federation Briefing on Prevention: Coronavirus Disease 2019 (COVID-19) in low-income

- When Novel Coronavirus (nCoV) Infection is Suspected, World Health Organization: Geneva (2020).
- [52] Zhong B-L, Luo W, Li H-M, Zhang Q-Q, Liu X-G, Li W-T, 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. *Int J Biol Sci.* (2020) 16:1745–52. Doi: 10.7150/ijbs.45221
- [53] Goni MD, Naing NN, Hasan H, Wan-Arfah N, Deris ZZ, Arifin WN, et al. Development and validation of knowledge, attitude and practice questionnaire for prevention of respiratory tract infections among Malaysian Hajj pilgrims. *BMC Public Health.* (2020) 20:189. Doi: 10.1186/s12889-020-8269-9.
- [54] Kassema, J. J. COVID-19 outbreak: is it a health crisis or economic crisis or both? Case of African Counties. *SSRN Electr J.* (2020) 9:4–14. Doi: 10.2139/ssrn.3559200
- [55] McKibbin WJ, Fernando R. The global macroeconomic impacts of COVID-19: seven scenarios. *SSRN Electr J.* (2020) 20–24. Doi: 10.2139/ssrn.3547729.
- [56] Giao H, Han NTN, Van Khanh T, Ngan VK, Van Tam V, Le An P. Knowledge and attitude toward COVID-19 among healthcare workers at District 2 Hospital, Ho Chi Minh City. *Asian Pacific J Trop Med.* 13:3–5. Doi: 10.4103/1995-7645.280396
- [57] Rehman H, Ghani M, Rehman M. Effectiveness of basic training session regarding the awareness of Ebola virus disease among nurses of public tertiary care hospitals of Lahore. *JPMA J Pakistan Med Assoc.* (2020) 70:477. Doi: 10.5455/JPMA.15677.
- [58] Abebe TB, Bhagavathula AS, Tefera YG, Ahmad A, Khan MU, Belachew SA, et al. Healthcare professionals' awareness, knowledge, attitudes, perceptions and beliefs about Ebola at Gondar University Hospital, Northwest Ethiopia: a cross-sectional study. *J Public Health Africa.* (2016) 7:570. Doi: 10.4081/jphia.2016.570.
- [59] Alfahan A, Alhabib S, Abdulmajeed I, Rahman S, Bamuhair S. In the era of corona virus: health care professionals' knowledge, attitudes, and practice of hand hygiene in Saudi primary care centers: a cross-sectional study. *J Commun Hospital Int Med Perspect.* (2016) 6:32151. Doi: 10.3402/jchimp.v6.32151
- [60] Wolf SM, Serper M, Opsasnick L, Conor RMO, Curtis LM. Awareness, attitudes, and actions related to COVID-19 among adults with chronic conditions at the onset of the U. S. outbreak. *Ann Intern Med.* (2020); 9:1–10. Doi: 10.7326/M20-1239.
- [61] Raab M, Pfadenhauer LM, Millimouno TJ, Hoelscher M, Froeschl G. Knowledge, attitudes and practices towards viral haemorrhagic fevers amongst healthcare workers in urban and rural public healthcare facilities in the N'zérékoré prefecture, Guinea: a cross-sectional study. *BMC Public Health.* (2020) 20:1–8. Doi: 10.1186/s12889-020-8433-2.

Citation: Ahmad Salisu Aliyu, Ahmed Habibu Badawi, Nuru Yakubu Umar, Dalhatu Umar, Hussaini Mohammed, *Epidemiological Study on Knowledge, Attitude and Practices towards Covid-19 among Health Care Workers at Infectious Diseases Hospital Kano, Nigeria.* *ARC Journal of Public Health and Community Medicine.* 2020; 5(3):20-30. DOI: [dx.doi.org/10.20431/2456-0596.0503003](https://doi.org/10.20431/2456-0596.0503003).

Copyright: © 2020 Authors. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.