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COVID-19 Knowledge among Healthcare Professionals in Gombe, Northeast, Nigeria: A Quick Online Cross-Sectional Survey

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Authors' contributions

This work was carried out in collaboration among all authors. Author RI designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors AY and AIG managed the analyses of the study. Author DMU managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Aims: Despite control measures adopted to check the rapid spread of the COVID-19 pandemic in Nigeria, healthcare workers still face a serious threat to infection due to SARS-CoV-2 virus. Adherence to control measures by healthcare workers depends on their knowledge. This study aimed to determine the knowledge of COVID-19 and related infection control practices among healthcare professionals in Gombe State.
Mythology: A cross sectional study was conducted among healthcare professionals in Gombe. Relying on our network with the healthcare professionals, 500 participants were recruited into

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the study using simple random sampling method. The data were collected using online questionnaire consisting of socio-demographic questions and 17questions based on knowledge and infection control practices related to COVID-19 disease in the healthcare setting adapted from a study in India. The data were analyzed using SPSS version 23 at uni-variate and bivariate levels with p value at < 0.05.

Results: Close to three-fourth (72.1%) of the participants reported correct answer about knowledge of COVID-19, thus overall knowledge was found to be adequate for all subgroups. About four-fifth (78.9%) of doctors' responses were correct. and the lowest (65.5%) was from CHOs, Laboratory assistants and health recorders. 43.7% of the participants could correctly define "close contact." More than three-fourths of the participants knew the various infection control measures like rapid triage, respiratory hygiene, and cough etiquette and having a separate, well ventilated waiting area for suspected COVID-19 patients. However, less than half (47.8) of the participants were aware of the correct sequence for the application of a mask/respirator, and 62.2% of them knew the preferred hand hygiene method for visibly soiled hands.

Conclusion: Regular health educational programs aimed at improving COVID-19 knowledge and infection control are needed.

Keywords: Knowledge; control; infection; COVID-19.

1. INTRODUCTION

Coronaviruses are a large group of viruses that are common throughout the community. Evidences have shown historically that the virus is a zoonotic disease transmitted through birds and mammals, with humans being particularly vulnerable to infection and transmission of the virus [1].

Coronavirus disease 2019 otherwise called "COVID-19" is one of the emerging respiratory diseases caused by a novel coronavirus known as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) [2]. SARS-CoV-2 is a new strain discovered in 2019, never found in human being before and seems to have originated from bats and first reported cases were from Wuhan, Hubei Province in China, suggesting an animal-to-person spread in a live animal market. The virus then spread outside Hubei to the rest of the world via human transmission. Several countries including Nigeria have now reported community spread. Due its wide spread across countries, the coronavirus disease was declared as a pandemic by World Health Organization (WHO) on March 11, 2020 [3].

The disease which is highly infectious has the following as its main clinical symptoms: fever, dry cough, fatigue, myalgia, and dyspnea. It was reported by WHO that more than 80% of COVID-19 patients showed mild symptoms and recovered without any medical intervention while approximately 20% of infected cases had a severe illness such as acute respiratory syndrome, septic shock and multi-organ failure, and that an estimated 2% of cases can be fatal [4].

The elderly and those with underlying chronic diseases are at higher risk of increased severity. It has been estimated in China that 18.5% of the patients with COVID-19 develop to the severe stage, which is characterized by acute respiratory distress syndrome, septic shock, difficult-to-tackle metabolic acidosis, and bleeding and coagulation dysfunction [5].

According to World Health Organization Weekly Epidemiological Report, as of 10 January 2021, 88 387 352cases of COVID-19 (in accordance with the applied case definitions and testing strategies in the affected countries) have been reported, including 1 919 204 deaths world-wide while in Africa there are 4 313 cases reported with 47 905 deaths [6].

In Nigeria, the first case was reported on the 27th February 2020 and as at January 17, 2021, 10,300 confirmed cases have been reported in 34 states including Gombe with 1504 deaths [7].

The infected cases in Nigeria were from travelers returning from abroad and following human-to-human transmission to their family and community members. Accordingly, the emergence of this infectious disease has caused much anxiety within the Nigerians due to the increasing number of suspected cases and the virus' unpredictable future.

There is no specific antiviral treatment and preventive vaccine currently. There are guidelines recommended to decline the spread of infection and respond to the challenges during the epidemic. CDC recommended that coronavirus spreads mainly from person-to-person by close contact (within about 6 feet) with infected people via respiratory (coughs or sneezes) or transmitted by touching a surface or object that the virus is on it.8 The best prevention is to avoid being exposed to COVID-19. This is done by washing hands with soap and water, and using face masks, isolating confirmed and suspected cases [8].

With these modes of transmission, healthcare workers are among the highest risk of being infected. The highly contagious SARS-CoV-2 virus is an additional occupational hazard for the healthcare system apart from the burden of extended work hours, physical and psychological stress, burnout, and fatigue [9]. In addition to healthcare workers (HCWs) being at a high risk of getting the infection, they can also be a source of transmission in the community. Some previous studies showed that HCWs had lack of knowledge and attitude toward MERS COV, [10] and SARS [11].

The objective of this study is to determine the knowledge of COVID-19 and its related infection control practices among healthcare professionals in the Gombe healthcare setting. The findings will help authorities organize the necessary health educational programs in order to provide up-to-date information and deliver the best practice to control the COVID-19 disease.

2. MATERIALS AND METHODS

An online cross sectional study conducted in Gombe State for the period of 17th to 30th January 2021. It involved the collection of information through the use of structured questionnaire to assess respondents on the study objectives. The study was conducted among healthcare professionals in Gombe State. Relying on our network with the healthcare professionals, the online questionnaires were sent to potential 500 healthcare professionals using simple random sampling method.

The questionnaire consists of socio-demographic questions and 17questions based on knowledge and infection control practices related to COVID-19 disease in the healthcare setting adapted from a similar study in India [12]. The dependent variable in this study is the knowledge of COVID-19 among the healthcare professional while the independent variables are the socio-demographic characteristics of the participants. The data was analyzed using SPSS version 23 at uni-variate and bivariate levels. The p value was set at < 0.05.

3. RESULTS AND DISCUSSION

To the best of our knowledge, this is the first study in northeast Nigeria examining COVID-19 knowledge and its related infection control practices among healthcare professionals in the healthcare setting among Nigerian healthcare professionals.

A total of 458 respondents out of 500 recruited into this survey filled the questionnaire completely and return back giving us a response rate of 91.6%. More than half (56.8%) of the respondents were from the age group of 31- 45years. About two-third of the respondents were males and about half (50.2%) were from tertiary health facility. Among the various categories of health professionals, 33.8% of the nurses, 26.4% of the doctors, 19.9% of the others (medical health recorders, CHOs and laboratory assistants), 14.4% of the medical laboratory scientist, 2.8% of the pharmacists and 2.6% of the physiotherapist participated in the study.

The identification and isolation of an active case and its close contacts is the most important step in preventing the spread of COVID-19. In our study, less than half of the responders knew the correct definition of a "close contact. This finding is similar to what was obtained in a study in India [12].

Correct hand hygiene practices play a crucial role in preventing the spread of COVID-19. Two basic methods to clean hands are hand washing and hand rubbing. The CDC recommends alcohol-based hand rub (ABHR) in most situations [13]. In our study the question on hand hygiene focused on the recommended hand hygiene technique for visibly soiled hands which is hand washing with soap and water for at least 20 seconds with the whole process lasting for up to 40-60 seconds [14]. In this study doctors have the highest correct response to this

Table 1. Socio-demographic characteristic

Demographic group	Sub group	Frequency	Percent
Age group	18 – 30yr	110	24
	31 -45 yrs.	260	56.8
	Above 45yrs	88	19.2
	Total	458	100
Gender	Female	160	34.9
	Male	298	65.1
	Total	458	100
Location	Gombe Central	187	40.8
	Gombe North	136	29.7
	Gombe South	135	29.5
	Total	458	100
Profession	Doctor	121	26.4
	Medical Laboratory scientist	66	14.4
	Nurse	155	33.8
	Others†	91	19.9
	Pharmacist	13	2.8
	Physiotherapist	12	2.6
	Total	458	100
Health facility type	Others*	19	4.1
	Primary	39	8.5
	Private	16	3.5
	Secondary	154	33.6
	Tertiary	230	50.2
	Total	**458**	**100**

*†: Community health officers (CHO), laboratory assistant and health recorders; *Health post, religion based HF.*

Table 2. Correct response according to profession

	Doctor	**MLS**	**Nurse**	**Pharmac**	**Physiother**	**Others**	**Total**
	(n=121)	(n=66)	(n=155)	ist (n=13)	apist(n=12)	(n=91)	(n=458
	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)
Q1	45(37.2)	12(18.2)	23(14.8)	2(15.4)	3(25.0)	10(11.0)	95(20.7)
Q2	121(100)	66(100)	155(100)	13(100)	9(75.0)	91(100)	455(99.3)
Q3	93(76.9)	38(57.6)	113(72.9)	6(46.2)	6(50.0)	50(54.9)	306(66.8)
Q4	86(71.1)	22(33.3)	49(31.6)	4(30.8)	3(25.0)	36(39.6)	200(43.7)
Q5	121(100)	55(83.3)	151(97.4)	11(84.6)	12(100)	83(91.2)	433(94.5)
Q6	67(55.4)	48(72.7)	91(58.7)	6(46.2)	6(50.0)	57(62.6)	275(60.0)
Q7	112(92.6)	51(77.3)	148(95.5)	10(76.9)	9(75.0)	70(76.9)	400(87.3)
Q8	104(86.0)	35(53.0)	90(58.1)	5(38.5)	9(75.0)	42(46.2)	285(62.2)
Q9	121(100)	45(68.2)	127(81.9)	9(69.2)	9(75.0)	43(47.3)	354(77.3)
Q10	116(95.9)	36(54.5)	151(97.4)	11(84.6)	12(100)	83(91.2)	409(89.3)
Q11	121(100)	63(95.5)	147(94.8)	13(100)	12(100)	84(92.3)	440(96.1)
Q12	103(85.1)	55(83.3)	136(87.7)	13(100)	12(100)	77(84.6)	396(86.5)
Q13	49(40.5)	27(40.9)	66(42.6)	4(30.8)	6(50.0)	21(23.1)	173(37.8)
Q14	57(47.1)	34(51.5)	79(51.0)	6(46.2)	6(50.0)	37(40.7)	219(47.8)
Q15	112(92.6)	46(69.7)	124(80.0)	11(84.6)	12(100)	66(72.5)	371(81.0)
Q16	113(93.4)	63(95.5)	144(92.9)	13(100)	12(100)	81(89.0)	426(93.0)
Q17	81(66.9)	57(86.4)	142(91.6)	13(100)	12(100)	75(82.4	380(83.0)
Total	78.9	67.1	73.5	67.9%	73.5%	65.0%	72.1%

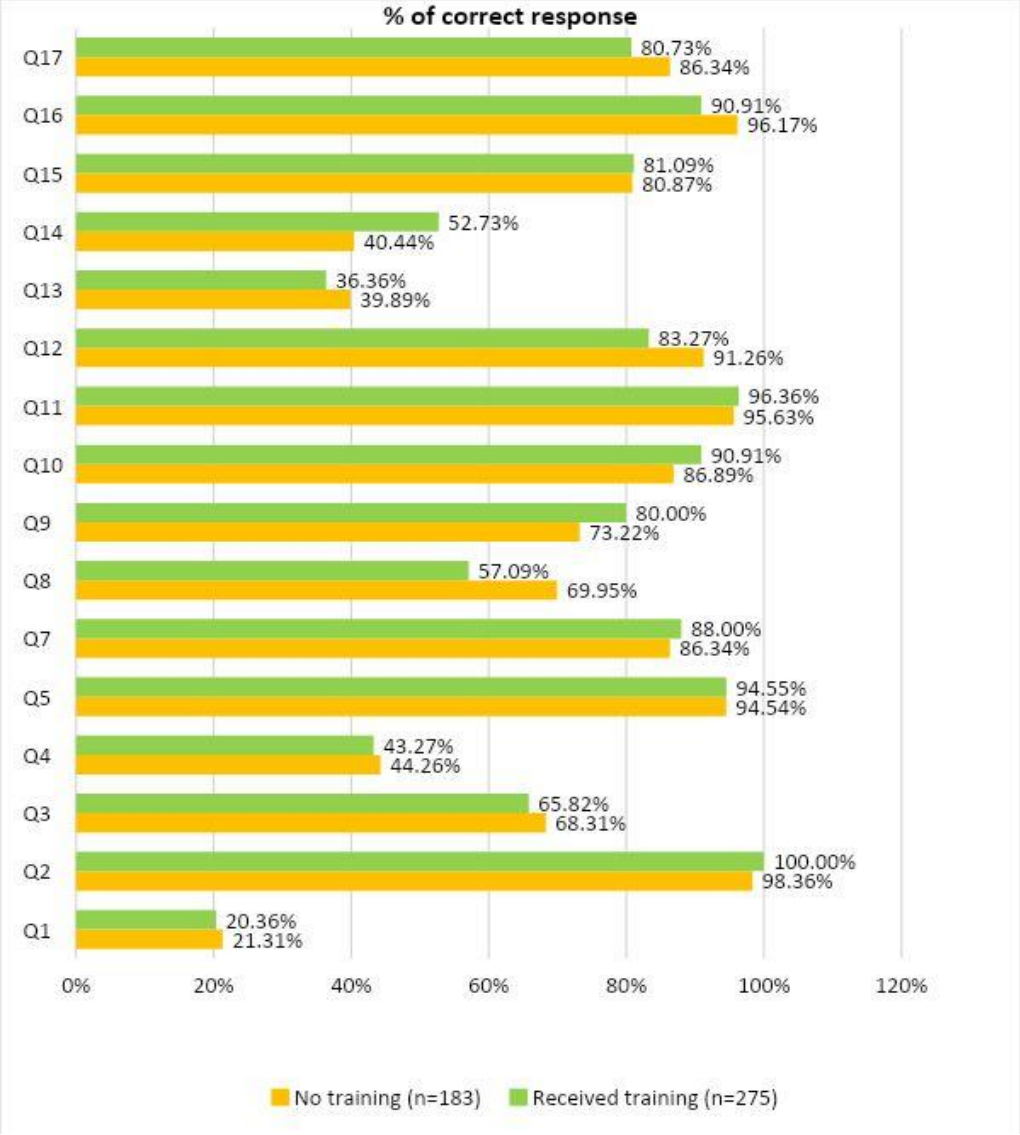

Fig. 1. Comparison of %correct responses between those who received training and no training on hand washing

question while the lowest was among other health workers (CHOs, Health recorders and laboratory assistants). This is in contrast from what was obtained in the India study [12].

Awareness of the use of personal protective equipment (PPE) for suspected/confirmed COVID- 19 cases were high among all categories of healthcare professionals. The CDC has provided Interim Infection Prevention and Control Recommendations for Patients with suspected or confirmed coronavirus disease 2019 (COVID-19) in healthcare Settings for PPE [15]. Besides being aware of the required PPE, it is also important to know the correct sequence of "donning and doffing" of PPE. But in our study despite high awareness of PPE, the knowledge of the correct sequence of donning and doffing of PPE is low among the participants. This is similar to study done in India [12].

4. CONCLUSIONS

Our study concluded that healthcare professionals from Gombe are adequately aware of COVID-19 in the healthcare setting with an overall percentage of 72.1% correct answers though there are versions in the

correctness of the answers to the questions asked among the various categories of the healthcare professionals. It is obvious from this study that periodic health educational interventions on infection control practices for COVID-19 across all healthcare professions need to be implemented to create more awareness.

CONSENT AND ETHICAL APPROVAL

Ethical clearance was obtained from State Ministry of Health Research Committee.

The participants were recruited into the study only after they were offered explanation about the objectives of the study and their consents were obtained. Confidentiality of the study subjects was maintained.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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QUESTIONNAIRE

1. The virus causing COVID-19 infection is called

   a. Severe Acute Respiratory Syndrome Coronavirus (SARS)
   b. Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2)
   c. 2019-nCov
   d. Both options B and C
   e. Both options A and C

2. First reports of cases were from Wuhan city in the Hubei Province of China

   a. True
   b. False

3. The main mode of transmission of virus from person to person is via

   a. Respiratory droplets
   b. Spread from contact with contaminated surfaces or objects

4. Which of the following is considered as close contact?

   a. Being within approximately 10 feet (3metres) of a patient with COVID-19 for a prolonged period of time.
   b. Being within approximately 6feet (2metres) of a patient with COVID-19 for a prolonged period of time
   c. Having direct contact with infectious secretions (sputum, serum, blood) from a patient with COVID-19
   d. Bothe options B and C
   e. Both options A and C

5. Reported illnesses have ranged from mild to severe symptoms of cough, fever, breathlessness which can appear 2-14 days after exposure. For which of the following is medical advice indicated?

   a. Have been in close contact with a person known to have COVID-19
   b. Currently residing in an area with ongoing COVID-19
   c. Recent travel from an area with ongoing spread of COVID-19 d. All of the above

6. Did you receive formal training in hand hygiene in the last three years?

   a. Yes
   b. No

7. Which of the following hand hygiene actions prevent transmission of the virus to the healthcare worker?

   a. After touching a patient
   b. Immediately after exposure to body
   c. After exposure to immediate surroundings of the patient
   d. Before putting on and upon removal of personal protective equipment (PPE) including gloves
   e. All of the above

8. Preferred method of hand hygiene for visibly soiled hand is

   a. Hand wash with soap and water for at least 10seconds

b. Hand wash with soap and water for at least 20 seconds
c. Use of alcohol based hand sanitizers with at least 60% alcohol

9. Use of face mask is not essential in which of the following?

a. People who are well, to protect themselves from COVID-19 infection
b. Being in close contact of a person suspected of or known to have COVID-19 infection
c. Healthcare professionals

10. Which of the following is the most effective methods for prevention of COVID-19 infection in the healthcare setting?

a. Avoid exposure (using Standard Precautions, Contact Precautions, and Airborne Precautions and eye protection when caring for patients with confirmed or possible COVID-19
b. Vaccination

11. What personal protective equipment (PPE) should be worn individuals transporting patients who are confirmed with or under investigation for COVID-19 within a healthcare facility?

a. Gloves
b. Gown
c. Eye protection
d. Respirator –N95mask
e. All of the above

12. What PPE should be worn by healthcare personal providing care to asymptomatic patients with a history of exposure toCOVID-19 who are being evaluated for a non-infectious complaint (e.g. hypertension or hyperglycemia)?

a. Gloves
b. Gown
c. Eye protection
d. Respirator –N95 mask
e. All of the above

13. Which of the following is the recommended for isolation of a patient with confirmed COVID-19 and those under investigation for COVID-19?

a. Airborne Infection Isolation Room (AIIR) with exhaust
b. Airborne Infection Isolation Room (AIIR) without exhaust

14. The following is the correct sequence for pulling on the mask or respiratory N95

a. Secure ties or elastic bands at middle of head and neck – Fit flexible band to nose bridge – fit snug to face and below chin –fit- check respiratory
b. Fit flexible band to nose bridge – secure ties or elastic bands at middle of head and neck – fit snug to face and below chin – fit-check respirator

15. Which of the following are recommended infection control measures upon arrival of patients with suspected COVID-19 infection?

a. Rapid triage of symptomatic patient
b. Implement respiratory hygiene and cough etiquette (i.e. placing facemask over the patient's nose and month if that has not already been done)
c. Have a separate, well ventilated space that allows waiting symptomatic patients to be separated by 6 or more feet
d. All of the above

16. Clinical management incudes prompt implementation of recommended infection prevention and control measures and supportive of complications. No specific treatment for COVID-19 is currently available.

a. True
b. False

17. A recommended infection prevention and control measure is to perform aerosol-generating procedures, including collection of diagnostic respiratory specimen in an Airborne Infection Isolation Room (AIIR)

a. True
b. False

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