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A Corona Virus Diseases 2019 (COVID-19) Knowledge Possessed by Primary Healthcare Workers in Ebonyi State, South-East Nigeria

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Abstract

The general objective of this study was to investigate COVID-19 knowledge possessed by primary healthcare workers (PHWs) in Ebonyi State, South-East Nigeria. Specifically, the study determined general knowledge of COVID-19, knowledge of: signs and symptoms, mode of transmission, and COVID-19 protocols possessed by PHW. The design was survey. The population was 1630 PHWs in Ebonyi state. Multi-stage sampling was used to select a sample of 400 respondents. Data were analyzed using frequencies and percentages. Major findings of the study show that PHWs possessed knowledge of indicators of the general knowledge of COVID-19 in varying frequencies (F) and percentages (%). Some of these indicators included: COVID-19 is a pandemic disease, 360(91.6%), a global emergency 376(95.7%), has high infectivity 210(53.4%), most coronavirus-led illnesses are generally mild, among others. Other findings are nine signs and symptoms of COVID-19 including, fever 374(95.2%), cough 375(95.4%), shortness of breath 362(92.1%), and others. Mode of transmission of COVID-19 include through droplets 373(94.9%), close contact 369(93.9%), and contaminated surfaces 352(89.6%). COVID-19 protocols knowledge possessed by PHWs were sneezing on the inner side of the elbow 302(76.8%), the use of face mask 291(74%), hand washing 384(97.7%), use of PPE 288(73.3%), single-use or disposable equipment 329(83.7%), among others. Based on the findings, three recommendations were made.

Keywords: COVID-19, Primary, Health, Workers, Knowledge, Symptoms, Protocol,

Introduction

Coronavirus disease 2019 (COVID-19/2019-nCoV) is a highly infectious emerging respiratory disease that is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2 a novel coronavirus). It was first detected in December 2019 in Wuhan, China as the cause of an outbreak of pneumonia of unknown cause.In January 2020, the outbreak of the 2019 novel coronavirus (2019-nCoV) in China spread progressively to other countries, with World Health Organization declaring it a

public health emergency of international concern {World Health Organization (WHO, 2020). Based on an early analysis of case series, the most common symptoms of the disease are fever, cough, dyspnea, myalgia, shortness of breath, fatigue. The less common symptoms include: anorexia, sputum production, sore throat, confusion, anosmia, hyposmia, dizziness, headache, rhinorrhea, dysphasia, leucopenia chest pain, hemoptysis, diarrhea, nausea/vomiting and abdominal pain (Wang Zhou, and Liu, 2020). The mode of transmission of COVID-19 was through respiratory droplets through coughing or sneezing, Close contact with infected person directly or indirectly, and contact with contaminated surfaces, objects or items of personal use

Every country was charged to take all necessary measures urgently, to slow down the further spread of the disease (WHO, 2020). It was stressed that containment of the virus could be achieved through timely detection, isolation and treatment of cases, contact tracing, physical and social distancing, in addition to a well-coordinated and comprehensive approach that engages the entire government machinery (WHO, 2020).

On March 9, 2020, Federal Government of Nigeria set up a Presidential Task Force (PTF) on COVID-19 with members drawn from key Departments and Agencies, Federal Ministries, and the WHO. Likewise, to work in collaboration with the PTF, COVID-19 task forces were initiated at the state levels (Federal Government, of Nigeria, 2020). On February 27, 2020, the first case of the COVID-19 was reported in Nigeria in a 44-year-old Italian citizen who visited Lagos, in the Southwestern region of the country (WHO, 2020). As the spread of the pandemic continued, the Ebonyi State government put up several strategies for its control including the enactment of Ebonyi State COVID-19 and other Infectious Diseases Law 2020, (News Agency, Nigeria, 2020) closure of all borders of entry into the State, constitution of the State Anti-COVID-19 Task Force, and imposition of curfew between 8.00 pm and 6.00 am. Others strategies include the banning of social gatherings in excess of 20 persons in places of worship and social events, restriction of number of passengers for commercial transport vehicles to two per seat, and enforcement of use of face masks in public places(Eze, 2020).

Despite the confirmation of the disease in neighboring States of Abia, Enugu, and Benue, Ebonyi State did not record any case of COVID-19 until April 26, 2020 (CDC, 2020). The appearance of an index case on that day made Ebonyi State one of the last in South-eastern geopolitical zone of Nigeria to report a case. However, despite the implementation of the various control measures, within a short period of the index case the State recorded more cases than those in the neighboring States. However, the sudden rise in the number of cases in the state within few weeks after the index case stirred the curiosity of the researchers to assess the COVID-19 knowledge possessed by healthcare workers in the State.

Ebonyi State Ministry of Health is responsible for developing and setting up health policies and monitoring their implementation in the state. Health workers are at the front line of the COVID-19 outbreak response and as such are exposed to hazards that put them at risk of infection. Primary health workers

constitute part of the health system of Ebonyi State since there are more rural than urban communities in the State. The workers are at high risk since of being infected since they are the first point of call for any affected individuals in the community. Therefore, Primary Health Workers (PHW) should be aware of issues relating to COVID-19 such as protocols, including physical distancing, wearing a mask, keeping rooms well ventilated, avoiding crowds, cleaning your hands frequently using alcohol based sanitizer, soap and water, coughing into a bent elbow or tissue, use of hand gloves (WHO, 2021). Health service delivery in Ebonyi State is structured into a three-tier system with the primary health care at the base, supported by the secondary and tertiary health care levels. The health system in the State is however extremely weak with the Primary and Secondary health care levels virtually collapsed. For each cadre of health workers, there is a minimum of 50 per cent gap between current availability and need as at 2015 (Ebonyi State Government Strategic Health Development Plan (2010-2015). Robust primary health care can significantly reduce pressure on health systems, through prevention, detection, and monitoring for early signs of an outbreak, treatment to less complex cases, and continuity of care for other health needs given its proximity to the community and its role as the first point of contact for people (WHO, 2021). The knowledge of COVID-19 possessed by Primary Healthcare workers should play a pivotal role in preventing COVID-19 at the community level. It is therefore important to find out the various aspect of knowledge of COVID-19 possessed by the primary health care workers in Ebonyi state. Such findings could be used to evolve ways of equipping the workers for their many responsibilities.

Objectives of the Study

The general objective of this study was to investigate COVID-19 knowledge possessed by primary healthcare workers in Ebonyi State, Nigeria. Specifically, the study determined the following COVID-19 knowledge indicators possessed by PHW in Ebonyi State:

1. aspects of general knowledge of COVID-19
2. signs and symptoms of COVID-19.
3. modes of transmission of COVID-19.
4. COVID-19 protocols

Methodology

***Design of the Study*:** This cross-sectional survey was conducted among primary healthcare workers in Ebonyi state.

***Area of the Study*:** This study was conducted in Ebonyi state, Nigeria. Health services to the people of Ebonyi State are provided through the services rendered by the Ministry of Health facilities. Currently there are 555 health facilities both registered private (138) and public health facilities (417). There are 171 wards in the state and each ward has their primary health care centers with limited health staffs.(Ebonyi State Ministry of Health, 2022). The area has there senatorial zones and 13 local government areas (LGAs)

***Population of the Study*:** The population for the study was made up of 1630 primary health care workers (PHC)currently working in Ebonyi State primary health care facilities based on available statistics from Ebonyi State Primary Healthcare Development Agency (EBSPHCDA, 2021), 1232(75.6%) females, and 398(24.4%) males. Majority

of the PHC workers are community health extension workers (CHEWS) (59.4%), medical doctors (22.1%), registered Nurses/Midwives (16.8%), and others (1.7%). The PHC workers address the main health problems in the community. They provide health promotion, preventive, curative and rehabilitative services accordingly.

Sample for the Study: The sample of 400 PHC workers were purposively selected from the three senatorial zones in the area of the study. Only the workers who were willing to participate in the study were selected.

***Instrument for Data Collection*:** Questionnaire was used for data collection. It was made developed based on literature review and the specific objectives of the study. It have two responses of "Yes"/ "No". Three experts in Health Education validated the instrument. The corrections and suggestions made by the experts were incorporated in the final version of the instrument. The instrument also yielded a reliability coefficient of 0.76 which was deemed high enough to consider the instrument reliable for use in this study.

Data Collection Procedure: A total of 400 copies of the questionnaires were administered to the respondents. Only 393 copies of the questionnaire were retrieved. This represents 98 percent return.

***Data Analysis Techniques*:** The data were analyzed using frequencies (F) and percentages (%). Data were presented in tables of frequencies tables and percentages. The correct points were summed up and the maximum score was 44 points. The final scores were considered the "COVID-19 knowledge score". Total possible score for knowledge was 44.Scores were re-categorized as poor knowledge if between 0- < 50 % of total (0-21), fair knowledge between > 50 and < 75% (22-31) and, good knowledge > 75% (32-44). A similar scoring system was used in study of Ireye, Ejiyere, Aigbiremolen, Famiyesin, Rowland-Udoh, Ogeyemhe, et al., (2019) to assess knowledge of their respondents on Lassa fever.

Findings of the Study

Socio-demographic characteristics of Respondents: Data analysis on characteristics reveals that the primary healthcare workers who participated in the study were 315 (80.2%) females, and 78(19.8%) males. Age distribution of the respondents were; 20-30years 75(19.1%), 31-40years 105(26.7%), 41-50 years 167(42.5%), 51 years above 46(11.7%). Rural respondents were 323(82.2%), while urban ones were 70(17.8%). Data on qualification showed respondents with tertiary education to be 341(86.8%), secondary education 40(10.2%) and primary education 12(3.1%). Data on years of work experience were: <10years experience 40(10.2%), 10-15years experience 123(31.3%), 16-25years experience 157(39.9%) and 26-35yearsexperience 73(18.6%). On profession, there were Community Health Extension Workers (CHEWs) 248(63.1%), Environmental Health Officers (EHOs) 56(14.2%), others 33(8.4%), Nurses 22 (5.6%), Medical Recorders 17(4.3%), Med Lab scientists 7(1.8%), Doctors 6(1.5%) and Pharmacists 4(1.0%). These are the categories ofhealth staff that responded to our questionnaire and their socio-demographics.

Table 1: Frequency and Percentage Responses on Indicators of General Knowledge of COVID-19Possessed by Primary Health Workers.

S/N	Indicators of General Knowledge on COVID-19	Yes (F %)	No (F %)
	Corona viruses are a family of viruses such as common cold, severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS)	329(83.7%)	64(16.3%)
	Corona virus was identified in China by Chinese authorities.	375(95.4%)	18(4.6%)
	COVID-19 is a pandemic disease	360(91.6%)	33(8.4%)
	COVID-19 is a type of Corona virus	353(89.8%)	40(10.2%)
	The name corona virus comes from the Latin word corona, meaning crown or halo	355(90.3%)	38(9.7%)
	Under an electron microscope, corona virus looks like it is surrounded by a solar corona	352(89.6%)	41(10.4%)
	Incubation period of corona virus range from 1-14 days	368(93.6%)	25(6.4%)
	Corona virus infected patients show symptoms within 5 to 6 days	349(88.8%)	44(11.2%)
	Corona virus Infected patients can also be asymptomatic, that is showing no symptoms	249(63.4%)	144(36.6%)
	Vaccine for COVID-19 is taken twice.	300(76.3%)	93(23.7%)
	Corona virus is a global emergency	376(95.7%)	17(4.3%)
	Corona virus has high infectivity	210(53.4%)	183(46.6%)
	Older people are twice as likely to have serious COVID -19 illness	290(73.8%)	103(26.2%)
	Most Corona virus led illnesses are generally mild, especially for children and young adults	215(54.7%)	178(45.3%)
	COVID-19 can be treated	172(43.8%)	221(56.2%)
	There can be re-occurrence after patients recovery	193(49.1%)	200(50.9%)
	Total knowledge		
	Good	257(65.0%)	
	Fair	130(33.1%)	
	Poor	6(1.5%)	

F = Frequency; % = Percentage

Table 1 shows that most 11(68.8%) of the items indicators of general knowledge of COVID-19, that is 11 items out of 16, obtained high percentage scores of 376(95.7%) – 290(73.8%). Only five items indicators obtained percentages of 429(63.4%) – 172(43.8%). This shows that most of the primary health workers possess high knowledge of the indicators of general knowledge of COVID-19. Overall, a majority 257(65.0%) had a good general knowledge on COVID-19 indicators.

Table 2: Frequency and percentage Responses on Knowledge on Signs and Symptoms of COVID-19 possessed by PHWs

S/N	Signs and Symptoms of COVID-19	Yes (F %)	No (F %)
1.	Fever	374(95.2%)	19(4.8%)
2.	Cough	375(95.4%)	18(4.6%)
3.	Shortness of breath	362(92.1%)	31(7.9%)
4.	Breathing difficulties	375(95.4%)	18(4.6%)
5.	Pneumonia	333(84.7%)	60(15.3%)
6.	Multiple organ failure	327(83.2%)	41(10.4%)
7.	Diarrhea	231(58.8%)	162(41.2%)
8.	Muscle weakness	340(86.5%)	53(13.5%)
9.	Fatigue	319(81.2%)	74(18.8%)
	Total knowledge		
	Good	328(85.5%)	
	Fair	42(10.7%)	
	Poor	23(5.9%)	

F = Frequency; % = Percentage

Table 2 shows that majority of Healthcare workers have knowledge of signs and symptoms of COVID -19. Each of all the eight signs has percentage scores of 375(95.4%). The Table shows, fever 374(95.2%), cough 375(95.4 %), shortness of breath 362(92.1%), breathing difficulties 375(95.4%), pneumonia 333(84.7%), multi organ failure 327(83.2%), diarrhea 231(58.8%), muscle weakness 340(86.5%) and fatigue 319(81.2%). Overall, a majority (85.5%) had a good knowledge on the signs and symptoms of COVID-19.

Table 3: Frequency and Percentage Responses on Possessed Knowledge of Modes of Transmission

S/N	Modes of Transmission	Yes (F %)	No (F %)
. 1	Respiratory droplets through coughing or sneezing	373(94.9%)	20(5.1%)
. 2	Close contact with infected person directly or indirectly	369(93.9%)	24(6.1%)
. 3	Contact with contaminated surfaces, objects or items of personal use	352(89.6%)	41(10.4%)
. 4	People cannot get infected through food	217(55.2%)	176(44.8%)
	Total knowledge		
	Good	358(91.1%)	
	Fair	26(6.6%)	
	Poor	9(2.3%)	

F = Frequency; % = Percentage

Table 3 reveals that majority of the workers had knowledge on mode of transmission. The Table shows item No 1 that COVID-19 can be contacted through droplets 94.9%, close contact 93.9%, contaminated surfaces 89.6% and not through food 55.2%. Overall, a majority (91.1%) had a good knowledge of the mode of transmission of COVID-19.

Table 4: Frequency and Percentage Responses on COVID 19 Protocols Possessed by PHW

S/N	COVID-19 Protocols	Yes (%)	No(%)
1	Sneezing in the inner side of elbow.	302(76.8)	91 (23.2)
2	Use offace mask when sick and also when taking care of patients with the symptoms.	291(74)	102(26)
3	Hand washing with soap and water or an alcohol-based sanitizer.	384(97.7)	9(2.3)
4	Avoid touching the eyes, nose and mouth with unwashed hands.	361(91.9)	32(8.1)
5	Avoid close contact with people (i.e., maintain a distance of at least 1meter (3feet), particularly those who have a fever or are coughing or sneezing.	358(91.1)	35(8.9)
6	Cover mouth and nose when coughing and sneezing, discard tissue immediately in a closed bin, and wash hands.	383(97.5)	10(2.5)
7	Isolating all suspected cases in a well ventilated area that is separate from other patients.	370(94.1)	23(5.9)
8	When single rooms are not available, place all suspected cases together in the same ward.	343(87.3)	50(12.7)
9	Use of PPE such as medical mask, gloves, an appropriate gown, and eye/facial protection (e.g., goggles or a face shield).	288(73.3)	105(26.7)
10	Prevention of needle stick and sharps injury	318(95.2)	19(4.8)
11	Safe waste management, environmental cleaning, and sterilization of patient care equipment and linen	284(80.9)	75(19.1)
12	Use single-use or disposable equipment.	329(83.7)	64(16.3)
13	Limitation of the number of healthcare workers, family members, and visitors in contact with the patient, ensuring optimal patient care.	170(43.3)	223(56.7)
14	All specimens collected for laboratory investigations are regarded as potentially infectious.	301(76.6)	92(23.4)
15	Disinfection inanimate surfaces in the surgery or hospital as patients may touch and contaminate surfaces such as door handles and desktops.	267(67.9)	126(32.1)
	Overall Knowledge		
	Good	280(71.2)	
	Fair	94(24)	
	Poor	19(4.8)	

Table 4 shows that the protocols reported by the respondents were: Sneezing in the inner side of elbow 302(76.8%), the use of face mask when sick and also when taking care of patients with the symptoms 291(74%), Hand washing with soap and water or an alcohol-based sanitizer 384(97.7%), Avoid touching the eyes, nose and mouth with unwashed hands 361(91.9%), Avoid close contact with people 358(91.1%), Cover mouth and nose when coughing and sneezing, discard tissue immediately in a closed bin, and wash hands 383(97.5%), Isolating

all suspected cases in a well ventilated area 370(94.1%), Use of PPE 288(73.3%), Prevention of needle stick and sharps injury (318(95.2%), Safe waste management, and environmental cleaning 284(80.9%), Use single-use or disposable equipment 329(83.7), and Disinfection inanimate surfaces in the surgery or hospital 267(67.9%). Overall, a majority 280(71.2%) had a good knowledge, 94(24%) fair, while a few 19(4.8%) had poor knowledge on the COVID-19 protocols. (Table 2)

Discussion of Findings

This current study, which is the first of its kind among PHWs in Ebonyi State, sought to assess their knowledge of concepts of COVID-19, its signs, symptoms, transmission, and protocols for prevention of the disease. Many studies have shown the knowledge of COVID-19 among health workers from many countries. Due to an increasing prevalence of COVID-19 in the state, there is a critical need to gather essential data on knowledge for effective control and preventive plans. Knowledge is a prerequisite for establishing beliefs, forming positive attitudes, and promoting positive behaviors. Individual cognition and attitudes toward disease affect their knowledge (McEachan, Taylor, Harrison, Lawton, Gardner, and Conner, 2016). Overall knowledge level of HCWs about COVID-19 was good in this study. Their level of knowledge on the aspects of general knowledge about COVID-19, signs and symptoms, modes of transmission, and COVID-19 protocols were 257(65.0%), 328(85.5%), 358(91.1%, 358(91.1%), and 280(71.2) respectively. In the same vein, Goni et al. (2019), in their study among health workers in Malaysia, reported a good level of knowledge which aligns with studies conducted in Nigeria, Uganda, Egypt, China, Nepal, Zambia, and Pakistan (Isiekwe et al., 2021, Sharaf and Kabel 2021, Olum, et al., 2020, Ahmed, et al., 2020, Khanal, and Singh 2020, and Madona, et al., 2019, Saqlain, et al., 2020).

Similarly, an Iranian study found that 99% of respondents had an excellent knowledge regarding the disease modes of transmission, but concerning the disease symptoms, only 86% had sufficient knowledge (Maleki, Najafi, Farhadi, Hosseini, and Naderi, 2020). Also results corroborate the findings of a study conducted in America by Balaban et al. (2013), where only 20.0% of the participant believed that viruses do not cause Infections. A good percentage of respondents had good knowledge about the transmission of Respiratory Tract Infection. At variance, a study from the United Arab Emirates reported poor knowledge about disease transmission and the symptom in a significant proportion among HCWs (Bhagavathula, Aldhaleei, Rahmani, Mahabadi, and Bandari, (2020). Also, Bakaeen et al. (2021) in their study among dental practitioners from Eastern Mediterranean, Sarfaraz, Shabbir, Mudasser, Khurshid, Al-Quraini, Abbasi, Ratnayake, and Zafar (2020), Asma, Shazia, and Muhammad (2020) reported poor knowledge among health workers in their various studies in Saudi Arabia.

Regarding knowledge of the Covid-19 protocols, hand washing, sneezing on the inner side of your elbow, refraining from touching your eyes, mouth, and nose, and putting on a surgical face mask were among the protocols frequently known by our participants. At variance with these findings, Kumar, Katto, Siddiqui, Saito, Jamil, Rasheed, and Ali (2020)

found HCWs' knowledge regarding the role of face masks in the prevention of the disease to be moderate to poor. Also, Olum et al. (2019) revealed that 17% of HCWs believed that general medical masks was not protective against COVID-19. While Ng, Poon, KiatPuar, Shan Quah, Loh, Wong, Tan, and Raghuram (2020) delineated that surgical masks are similarly as effective as N95 respirators if used with hand wash and other infection prevention precautions.

In this study, only 43.3% had knowledge of the limitation of the number of healthcare workers, family members, and visitors in contact with the patient in ensuring optimal patient care. Likewise Abdel Wahed et al. (2020); Saqlain et al. (2020); Maleki et al. (2020); Wang et al. (2020) reported overcrowding in the emergency rooms as a barrier in infection control practice that could make them at high risk of getting the infection.

According to Akram (2020), Human coronaviruses remain infectious on dry surfaces for 2–9 days at room temperature, duration can be shorter at a temperature of 30 °C or more. Unlike a human, veterinary coronaviruses persist even longer for 28 days. Contamination of frequent-use surfaces in healthcare and home settings is a potential source of viral transmission. In this study, only about 67.7% knew about the disinfection of inanimate surfaces during surgery or hospital to prevent infection transmission. However, Wang et al. (2020) reported that virus contamination in areas frequently touched by patients in the isolation ward was high due to low awareness of the correct disinfection protocol. The knowledge of COVID-19 protocols among health workers is vital as the application will slow the spread of the infection in the work environment and the general public.

Conclusion

HCWs are the frontline defense in the war against COVID-19. The study showed that they had good knowledge on the indicators of general knowledge, signs and symptoms, mode of transmission and COVID-19 protocols. Despite the good knowledge score observed in this study, some knowledge gaps exist in the knowledge of treatment and COVID-19 protocols especially in the area of overcrowding during patient care and visit and in disinfection of inanimate surfaces in the healthcare facility.

Recommendation

The following recommendations were made based on the findings of the study.

1. There should be constantly updated educational programs related to COVID-19, this will contribute to improving the healthcare workers' knowledge of COVID-19.
2. Self-reported knowledge could not be very reliable as there could be some bias, therefore it is recommended that observatory studies should be carried out to really ascertain the level of knowledge of health workers towards COVID-19.
3. Further studies on the ways of enhancing health workers' knowledge is recommended

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