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Knowledge, perceptions and safety practices of COVID-19 infection among healthcare workers in a tertiary health institution, Southwest, Nigeria

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ABSTRACT

Background: Globally, COVID-19 is a topic of concern among the populace and especially with the health care workers. Recent report by NCDC showed that globally as at August 2020, the world had witnessed 17,396,943 cases with 675,060 deaths presenting a case fatality rate of 3.89%. This study assessed the knowledge, perception and safety practices of COVID-19 infection among healthcare workers.

Methods: It was a descriptive cross-sectional study. Both qualitative and quantitative methods were used. 410 participants drawn across most units in the hospital. Data analysis was done using SPSS software version 20. Responses were summarized using percentages, and frequencies. Test of association done using chi-square, and level of significance set at 5% (p<0.05).

Results: This study found mean population 39.23±9.87 years with modal of 30-39years. All 410 (100.0%) respondents heard about COVID-19 pandemic but further knowledge rating showed 347 (84.6%) had good knowledge. Perception was high at all thematic areas, 275 (67.1%) affirmed that COVID-19 infection was fatal. About 273 (66.6%) strongly agreed that PPE must be worn, similarly, 299 (72.9%) strongly agreed that use of facemask was important for infection prevention strategy. However, observational checklist gave varied opinion on availability and use of PPEs.

Conclusions: This study identified a significant gap in information source, knowledge levels especially among lower cadre staff, discrepancies in perceptions of COVID-19 and unavailability of PPEs. There is a need by the government and hospitals management to ensure regular training of all cadres of staff and regular provision of PPEs for the healthcare workers.

Keywords: Health institutions, Healthcare workers, Infections, Knowledge, Perception, Safety-practices

INTRODUCTION

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the virus responsible for the coronavirus disease 2019 (COVID-19) previously called the '2019-novel coronavirus'. The SARS-CoV-2 is an enveloped positive-sense single-stranded RNA virus believed to have a zoonotic origin; it is 96% similar at the whole-genome level to a bat coronavirus.

Coronaviruses are a large family of RNA viruses that infect birds and many mammals including humans. These viruses cause illnesses that range from common cold to more severe respiratory diseases and rarely gastroenteritis. Coronavirus disease (COVID-19) is caused by an emerging strain of coronavirus (SARS-Cov-2) that has not been previously identified in humans, belonging to the same family of viruses responsible for severe acute respiratory syndrome (SARS) and Middle

East respiratory syndrome (MERS), for which zoonotic and person-to-person transmission have been confirmed. CoV is zoonotic pathogens that can be transmitted via animal-to-human and human-to-human.² Multiple epidemic outbreaks occurred during 2002 (SARS) with approximately 800 deaths and 2012 (Middle East respiratory syndrome: MERS-CoV) with 860 deaths. Approximately eight years after the MERS-CoV epidemic, the current outbreak of novel coronavirus (COVID-19) in Wuhan City, Hubei Province of China, has emerged as a global outbreak and significant public health issue.³

On 30th January 2020, the World Health Organization (WHO) declared COVID-19 as a Public Health International Concern Emergency of (PHEIC). Astonishingly, in the first week of March, a devastating number of new cases were reported globally, emerging as a pandemic. As of 9th March 2020, more than 110,000 confirmed cases across 105 countries and more than 3800 deaths had been reported.3,4 Africa reported its first case in Egypt on 14th February 2020 and Nigeria reported its index case of COVID-19 on 27th February 2020 who was an Italian national. By 21st March, 2020 the Federal Ministry of Health (FMoH) confirmed 10 new cases of the coronavirus disease (COVID-19) in Nigeria; 3 new cases in the Federal Capital Territory (FCT) and 7 new cases in Lagos State. This brought the total number of confirmed cases in Nigeria to 22.5

In Nigeria, there were 7,839 cases and 226 deaths across the 35 affected states including the Federal Capital Territory, with a case fatality rate of 3% as of 24th May 2020, as reported by the Nigeria Centre for Disease Control (NCDC).⁶ Current evidence suggests that the country has entered the widespread community transmission phase as majority of those affected (56%) were found to have no epidemiological link to any known case and 23% were known contacts of confirmed cases.⁶

Recent report by the NCDC showed that globally as at 2nd August, 2020 the world has witnessed 17,396,943 cases with 675,060 deaths presenting a case fatality rate of 3.89% and 214 countries affected excluding 2 international conveyance.⁷ The situation in Nigeria has shown an increasing evidence of unhindered community transmission with 43,841 confirmed cases in 37 States including FCT out of 287,532 samples tested with case fatality rate of 2.0%. Most cases were among the age group 31-40 years which forms 25% of the cases confirmed.⁷

In spite of the challenges facing health system delivery in Nigeria, the Federal Ministry of Health alongside the Nigerian Centre for Disease Control continued to make efforts at containing the global pandemic situation through daily increase in testing capacity, providing guidelines on case definition, community case search, advisory on use of facemask, rational use of personal

protective equipment (PPE) in the care of COVID-19 cases in healthcare settings.⁸

However, the healthcare workers who are supposed to provide support and care against the spread of coronavirus must be abreast with information and requisite knowledge to prevent hospital acquired infection and ensure effective infection prevention and control. Healthcare authorities already initiated awareness and preparedness activities beyond the borders. A poor understanding of the disease among healthcare workers (HCWs) may have implication in delayed treatment and the rapid spread to infection.⁹

The study aimed to investigate the knowledge, perceptions, and safety practices among health workers in Federal Medical Centre, Abeokuta (FMCA), in association with COVID-19 infection with a view to preventing its spread among frontline healthcare providers in the facility and the state and country at large.

METHODS

Study area

Ogun state is one of the states in South West Nigeria. She is blessed with categories of health facilities including the Federal, State, Faith based hospitals and Primary Health Care centres with good representation of all cadres of health care workers (HCW).

The study was conducted at Federal Medical Centre, Abeokuta (FMCA), Ogun State. FMCA is a tertiary health facility under the purview of Federal Ministry of Health with large attendance of patients within and outside Ogun State.

Study population

Respondents composed of health care workers in the health institution ranging from Physicians from different subspecialties, Nurses, Pharmacist, community healthcare works, Health Attendants and Administrative staff. These are broadly divided into junior and senior staff.

Inclusion criteria

All staff both medical and non-medical who are employed in the services FMCA at the period of the research.

Exclusion criteria

All medical and non-medical staff working in the State hospitals and those in Private hospitals in Ogun State.

Study design

The study was a descriptive cross-sectional study, webbased among healthcare workers in Federal Medical Centre, Idi-Aba, Abeokuta, Ogun State which was conducted from May 2020 to July 2020.

Sampling technique

Respondents for the quantitative aspect of the study were selected through a web-based self-administered questionnaire. Participants were recruited through an online link sent to individuals' e-mail addresses until the sample size was completed.

A key informant interview (KII) was conducted among the selected health care workers through non-probability convenient sampling technique across selected major units within the health facility. Similarly, observational checklist was used in some selected units within the hospital using non-probability convenient sampling method also.

Sample size estimation

The prevalence (61%) for the sample size was taken from a study on knowledge of COVID-19 infection among HCW.⁴

The minimum sample size for this study was determined using the Fischer formula for studying proportions with population less than 10,000.

$$nf = n/1 + n/N$$

Where

nf = the desired sample size when the population is less than 10,000

n= the sample size when the population is more than 10,000

N =the estimate of the population 10

$$N = \frac{z^2 pq}{d^2}$$

- Z- Standard normal deviate set at 1.96 which corresponds to the 95% confidence interval
- P- Proportion in the population estimated to have a characteristic of interest (61.0%)

$$q=1-p$$

D-Degree of accuracy desired (0.05)

Therefore, calculating for n

$$n = \frac{z^2 pq}{d^2}$$

$$=\frac{1.96^2\times0.61\times0.39}{0.05^2}$$

$$=\frac{3.8416\times0.61\times0.39}{0.0025}$$

$$=\frac{0.914}{0.0025}$$

$$= 365.57$$

$$nf = n/1 + n/N$$

Where n = 366

N = 3,061 (total population of Health workers in the service of FMCA)

Therefore nf = 366/1 + 366/3,061

= 366.120

To adjust the estimated minimum sample size for non-response.

Ns = n/expected response rate

Expected response rate is 90%

Ns = 366.12/0.9

=406.80

=410

A total sample population of 410 was involved in this study to cut across all cadres of healthcare workers.

Survey instruments

The 36-item survey instrument for the quantitative was developed using WHO course materials. 4,9-12 The instruments consisted of 36-close ended questions and took approximately 5-10 minutes to complete. It was divided into four parts including participant characteristics (4 items), knowledge about COVID-19 infection and viral characteristics (13 items), perceptions toward COVID-19 (6 items/yes or no questions) and safety practices of COVID-19 among HCWs (13-items/4-point Likert scale).

For the qualitative methods, a key informant Interview guide was used to conduct interviews among the selected health workers. Similarly, an observational checklist was used in some selected units within the hospital in addition.

Data collection and analysis

The data was analysed using SPSS software version 20. Knowledge was scored based on 9 questions under

knowledge domain, scores of 0-5 were considered to have poor knowledge and those between 6 and 9 were considered to have good knowledge. Perception was also scored based on 9 questions under perception domain and scores of 0-4 were considered to have poor perception while those between 5 and 9 were considered to have good perception. Responses by respondents were summarized using percentages and frequencies. Test of association was done using chi-square and level of significance set at 5% (p<0.05).

The key informant interview questions were open ended to address themes and issues under investigation for clarity. Transcription of the salient themes was done to draw out key points. Tape recordings was analysed. Observational checklist was also analysed thematically with information summarized in tabular form.

Ethical approval

Ethical approval for this study was obtained from the Federal Medical Centre Abeokuta Ethical Review Committee. Confidentiality of the study participants' information was maintained throughout the study by making the participants' information anonymous and requesting participants to provide honest answers. Eligible HCWs participation in this survey was voluntary and was not compensated. Informed consent was obtained from each participant prior to their participation.

RESULTS

This study found mean age of population to be 39.23±9.87 years with modal age of 30-39 years. Male gender was more preponderance with 237 (57.8%). More participation was recorded among the pharmacy department 84 (20.5%), followed by community medicine 51 (12.9%) and family medicine 50 (12.3%), radiology and pathology had the least representation with 25 (6.1%) each. While senior staff dominated 233 (56.8%), more of the respondents who had spent between 5 or more years constituted the bulk of participants 263 (64.1%) (Table 1).

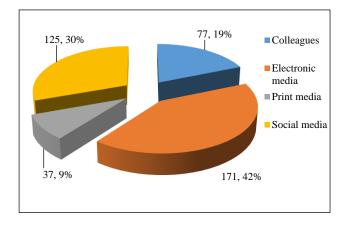


Figure 1: Sources of information on COVID-19 virus.

Interestingly, all 410 (100.0%) respondents had heard about COVID-19 pandemic but further knowledge rating showed 347 (84.6%) had good knowledge while 63 (15.4%) had poor knowledge (Table 2). This finding was supported by the key informant interview (KII) where "All participants were aware of COVID-19 infection. Presently COVID-19 was top most amongst other nosocomial infections". Knowledge source were mostly through electronic media 171 (42%), social media followed closely with 125 (30.0%) while print media was the least source of information 37 (9%). In the same vein, most of the respondents 249 (60.7%) could not attend any form of training on COVID-19 since the beginning of the pandemic. The KII supported this assertion "I will say No, but individuals are making efforts to get themselves updated on what to do".

Table 1: Socio-demographic characteristics of respondents.

| ¥7 | E 410 | Demonstrate | | |
|-----------------------------|-----------------|-------------|--|--|
| Variables | Frequency n=410 | Percentage | | |
| Age groups (years) | | | | |
| ≤29 | 73 | 17.8 | | |
| 30-39 | 137 | 33.4 | | |
| 40-49 | 112 | 27.3 | | |
| ≥50 | 88 | 21.5 | | |
| Mean±SD | 39.23±9.87 | | | |
| Gender | | | | |
| Female | 173 | 42.2 | | |
| Male | 237 | 57.8 | | |
| Area of specialty | | | | |
| Admin | 37 | 9.0 | | |
| Pharmacy department | 84 | 20.5 | | |
| Community health | 51 | 12.9 | | |
| Family medicine | 50 | 12.3 | | |
| Surgery | 38 | 9.3 | | |
| Nursing | 38 | 9.3 | | |
| Physiotherapy | 62 | 15.1 | | |
| Radiology | 25 | 6.1 | | |
| Pathology | 25 | 6.1 | | |
| Cadre | | | | |
| Junior staff | 177 | 43.2 | | |
| Senior staff | 233 | 56.8 | | |
| Years of working experience | | | | |
| 1-2 | 97 | 23.7 | | |
| 3-4 | 50 | 12.2 | | |
| 5 or more | 263 | 64.1 | | |

Perception was high at all thematic areas, 275 (67.1%) affirmed that COVID-19 infection is fatal against 135 (32.9%) who suggested otherwise. In the area of Infection Prevention and Control (IPC), 398 (97.1%) believed that washing of hand with soap and water is important for the prevention of COVID-19 infection transmission. Overall perception rating showed that 373 (91.0%) had good perception compared with 37 (9.0%) with poor perception rating (Table 3).

Table 2: Knowledge of COVID-19 among respondents.

| Variables | Frequency | Percentage | | |
|------------------------------|-------------------------|------------|--|--|
| Heard of COVID-19 | | | | |
| Yes | 410 | 100.0 | | |
| No | 0 | 0.0 | | |
| Knowledge grade of re | espondents on C | COVID-19 | | |
| Good knowledge | 347 | 84.6 | | |
| Poor knowledge | 63 | 15.4 | | |
| Attended training sinc | e beginning of j | pandemic | | |
| Yes | 161 | 39.3 | | |
| No | 249 | 60.7 | | |
| Type of virus | | | | |
| RNA | 273 | 66.6 | | |
| DNA | 137 | 33.4 | | |
| Corona is a type of | | | | |
| Enveloped virus | 309 | 75.4 | | |
| Non enveloped virus | 101 | 24.6 | | |
| Corona virus is | | | | |
| Zoonotic diseases | 209 | 51.0 | | |
| Human diseases | 201 | 49.0 | | |
| Means of transmission | | | | |
| Airborne | 50 | 12.2 | | |
| Contact | 87 | 21.2 | | |
| Droplets | 235 | 57.3 | | |
| Person to person | 38 | 9.3 | | |
| People at risk of infect | ion | | | |
| Health care | 60 | 14.6 | | |
| personnel's | 00 | 14.0 | | |
| Contact with infected | 343 | 83.7 | | |
| person | JTJ | 03.1 | | |
| People with recent | 7 | 1.7 | | |
| travel history | | 1., | | |
| Animals that can transmit it | | | | |
| Bat | 311 | 75.9 | | |

| Variables | Frequency | Percentage | | | |
|---|---|------------|--|--|--|
| Dog | 74 | 18.0 | | | |
| Rat | 25 | 6.1 | | | |
| Symptoms of the virus | | | | | |
| Fever, cough and respiratory discomfort | 410 | 100.0 | | | |
| Supportive care is the o | Supportive care is the current line of management | | | | |
| No | 13 | 3.2 | | | |
| Yes | 397 | 96.8 | | | |
| Ways to prevent infection | Multiple response | | | | |
| Hand washing | 410 | 100.0 | | | |
| Covering with nose and mouth mask | 410 | 100.0 | | | |
| Social distancing | 410 | 100.0 | | | |

Table 3: Perception on COVID-19.

| Variables | Yes (%) | No (%) | | |
|---|-------------|------------|--|--|
| COVID-19 is a fatal infection | 275 (67.1) | 135 (32.9) | | |
| Eating well and safe handling of cough and cold in outbreak is key | 397 (96.8) | 13 (3.2) | | |
| Sick patient should share recent travel history with healthcare providers | 410 (100.0) | 0 (0.0) | | |
| Disinfecting equipment and hospital once a day prevents infection | 285 (93.9) | 25 (6.1) | | |
| Washing of hands with soap and water can help prevent transmission | 398 (97.1) | 12 (2.9) | | |
| Overall perception of respondents on COVID-19 | | | | |
| Good perception | 373 | 91.0 | | |
| Poor perception | 37 | 9.0 | | |

Table 4: Safety practices towards COVID-19.

| Variables | Strongly agree (%) | Agree (%) | Neutral (%) | Disagree (%) | Strongly disagree (%) |
|---|--------------------|--------------|----------------|-----------------|--------------------------|
| Use of PPE is necessary during procedures | 273 (66.6) | 112 (27.3) | 25 (6.1) | 0 (0.0) | 0 (0.0) |
| Complete collection of data is required after confirmed diagnosis | 248 (60.5) | 149 (36.3) | 0 (0.0) | 13 (3.2) | 0 (0.0) |
| Suspected cases should be cared for in isolation | 147 (35.9) | 188 (45.9) | 26 (6.3) | 49 (12.0) | 0 (0.0) |
| Training and observation of precautionary measures are required | 336 (82.0) | 74 (18.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Suspected and probable cases must be reported immediately to NCDC | 323 (78.8) | 87 (21.2) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Contacts tracing should be done effectively | 272 (66.3) | 138 (33.7) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| The use of N95 masks is necessary when taking samples | 299 (72.9) | 87 (21.2) | 0 (0.0) | 24 (5.9) | 0 (0.0) |

To ensure proper safety precaution and practices, necessary personal preventive equipment (PPE) must be worn during every procedure, 273 (66.6%) strongly agreed with this, similarly, 299 (72.9%) strongly agreed

that use of facemask is important for infection prevention strategy. Majority of the respondents 323 (78.8%) strongly agreed that suspected or probable case must be reported immediately to Nigeria Centre for Disease Control, no one disagreed with this (Table 4).

Table 5: Analysis of observational checklist for knowledge, availability and practice of PPE.

| Variables | Frequency | Percentage (%) | | | |
|---|---------------------|----------------|--|--|--|
| Is this place (section of health facility) predisposed to COVID-19 | | | | | |
| Yes | 7 | 100.0 | | | |
| No | 0 | | | | |
| Is there risk of COVID-19 due to presence of sharp, bloodstained or other l | ody fluid materials | ? | | | |
| Yes | 6 | 85.7 | | | |
| No | 1 | 14.3 | | | |
| Are the following available in the facility | Present (%) | Absent (%) | | | |
| Availability of Infrared Thermometers | 5 (71.4) | 2 (18.6) | | | |
| Availability of face masks | 7 (100) | 0 | | | |
| Availability of Face shield | 2 (18.6) | 5 (71.4) | | | |
| Availability of gloves | 7 (100.0) | 0 | | | |
| Availability of goggles | 4 (57.1) | 3 (42.9) | | | |
| Availability of protective apparel | 7 (100.0) | 0 | | | |
| Availability of respirators | 1 (14.3) | 6 (85.7) | | | |
| Availability of safety boot | 5 (71.4) | 2 (18.6) | | | |
| Availability of running water | 7 (100.0) | 0 | | | |
| Availability of soap | 7 (100.0) | 0 | | | |
| Availability of sodium hypochlorite | 7 (100.0) | 0 | | | |
| Availability of waste bin | 7 (100.0) | 0 | | | |
| Environmental assessment | Adequate | Inadequate | | | |
| Environmental cleanliness | 7 (100.0) | 0 | | | |
| Work space | 4 (57.1) | 3 (42.9) | | | |
| Correct use of protective equipment | Yes | No | | | |
| Are the health workers putting on their personal protective devices as they are working | 6 (85.7) | 1 (14.3) | | | |
| Are the protective devices properly worn | 7 (100.0) | 0 | | | |
| Is the infrared thermometer positioned at 1 meter to the patient | 4 (57.1) | 3 (42.9) | | | |
| Is the infrared thermometer functioning | 5 (85.7) | 2 (14.3) | | | |
| Is hand washing being practiced after each task | 7 (100.0) | 0 | | | |
| Is hand washing being properly done | 7 (100.0) | 0 | | | |

However, the qualitative observational checklist gave varied opinion on availability and use of the PPEs. Among the selected units within the hospital- facemask, gloves, running water, soap, sodium hypochlorite and waste bin were 7 (100.0%) available for use while respirator 1 (14.3%), face shield 2 (18.6%), goggle 4 (57.1%) and infrared thermometer 5 (71.4%) were variedly available (Table 5). The KII revealed information supporting some of the findings "No, they are giving periodically and in situation where there is any reported case. Not every time that PPE is available. Sometime we need to call Acting Chief Nursing Officer to provide it for us".

Infrared thermometers were observed to be properly placed at 1 meter away from the patient in 4 (57.1%) of the facility units, while 5 (85.7%) of the hospital units had properly functioning infrared thermometers. It was also observed that 6 (85.7%) of the assessed units put on their PPEs as they were working. Similarly, the KII study supported the findings presented "Since we are all self-educated, there is this awareness to use such, so we try to conform. For staff working on COVID-19 patients, under

must you must put it on before taking care of the patient". The KII also revealed that though there were neither benefit for using PPE regularly and correctly "I have not seen any one rewarded for using PPE. I have not come across any worker been rewarded" nor were any punitive measures for not wearing correct PPE for procedures in the hospital "There is no punishment for workers who do not use PPE". Most of the cross-section of the KII asserted that "More training and enlightenments should be provided about use of PPEs".

Socio-demographic variables were found to have strong relationship with knowledge of COVID-19 among the respondents. The mean age of 38.78 ± 9.97 years showed good knowledge on issues of COVID-19 and this relationship was found to be statistically significant (α =0.001). Equally Male gender had more knowledge of COVID-19 compared with female gender, it was also statistically significant (α =0.002). Though, cadre and years of working experience were associated with knowledge of COVID-19, they were not statistically significant.

Table 6: Association between knowledge of respondents on COVID-19 and socio-demographic variables.

| Variables | Knowledge | - | χ² | P | |
|-----------------------------|------------|-------------|--------|-------|--|
| | Poor (%) | Good (%) | | | |
| Age groups (| (years) | | | | |
| ≤29 | 0 (0.0) | 73 (100.0) | | 0.001 | |
| 30-39 | 38 (27.7) | 99 (72.3) | 61.223 | | |
| 40-49 | 0 (0.0) | 112 (100.0) | 01.223 | | |
| ≥50 | 25 (28.4) | 63 (71.6) | | | |
| Mean±SD | 41.71±8.98 | 38.78±9.97 | | | |
| Gender | | | | | |
| Female | 38 (22.0) | 135 (78.0) | 10.023 | 0.002 | |
| Male | 25 (10.5) | 212 (89.5) | 10.025 | | |
| Cadre | | | | | |
| Junior staff | 13 (7.3) | 164 (92.7) | 1.070 | 0.301 | |
| Senior staff | 24 (10.3) | 209 (89.7) | 1.070 | | |
| Years of working experience | | | | | |
| 1-2 | 12 (12.40 | 85 (87.6) | | | |
| 3-4 | 13 (26.0) | 37 (74.0) | 5.187 | 0.075 | |
| 5 or more | 38 (14.4) | 225 (85.6) | | | |

Table 7: Association between socio-demographic characteristics of respondents and their perception.

| Variables | Perception | χ^2 | P | |
|-----------------------------|-------------|-------------|--------|-------|
| | Poor (%) | Good (%) | | |
| Age groups | (years) | | | |
| ≤29 | 12 (16.4) | 61 (83.6) | | 0.001 |
| 30-39 | 0 (0.0) | 137 (100.0) | 60.961 | |
| 40-49 | 0 (0.0) | 112 (100.0) | 09.804 | |
| ≥50 | 25 (28.4) | 63 (71.6) | | |
| Mean±SD | 46.89±14.77 | 38.47±8.93 | | |
| Gender | | | | |
| Female | 0 (0.0) | 173 (100.0) | 20.600 | 0.001 |
| Male | 37 (15.6) | 200 (84.4) | 29.000 | |
| Cadre | | | | |
| Junior staff | 13 (7.3) | 164 (92.7) | 1.070 | 0.301 |
| Senior staff | 24 (10.3) | 209 (89.7) | 1.070 | 0.301 |
| Years of working experience | | | | |
| 1-2 | 12 (12.40) | 85 (87.6) | | |
| 3-4 | 0 (0.0) | 50 (100.0) | 6.357 | 0.042 |
| 5 or more | 25 (9.5) | 238 (90.5) | | |

The various socio-demographic strata had differential perception of COVID-19 as shown in Table 6. The mean age 38.47 ± 8.93 years demonstrated good perception compared to other age groups and this association was statistically significant (α =0.001). In the same vein, female gender had better perception of COVID-19 than the male gender, this was statistically significant (α =0.001). Similarly, years of working experience of 3-4 years and 5 or more showed better perception of COVID-19 (α =0.042) (Table 7).

DISCUSSION

At present, COVID-19 is a global topic of discussion in the media and among the public, especially among HCWs and patients. With the currently mounting COVID-19 transmission raising tensions for everyone, including health officials and health systems, an important question arises regarding how we manage information to help frontline HCWs in times of public health crisis. For this reason, we investigated HCWs' knowledge and perceptions of the prevention and control of COVID-19 at the pandemic level. This study found a strong association between knowledge and perceptions on COVID-19 infection transmission among HCWs in the health institution with their socio-demographic characteristics such as age, gender, years of experience in service. Generally, all the age group had knowledge of COVID-19 pandemic though the mean age in this study was 39.23±9.87 years. This was similar to what Delgado et al found among Latin Americans, with most respondents between the ages of 35-45 years of age and 18-39 years in another related study among Nigerians and Egyptians. 15,16 There were more male participants in this study compared with female gender, this was similar to the study in United Arab Emirate.14

Study participation varied across different categories of HCWs. Our study revealed more senior health workers participated in this study, a breakdown by professional qualification showed that pharmacists had more representation than doctors especially in specialties like Community Medicine and Family Medicine; nurses and administrative staff had same proportion. The Latin American study also reported that doctors had more participation though there was no categorization into specialization as we did in this study, their report revealed that physicians and Nurses who worked in both hospitalbased ad private practice in Spanish-speaking countries in North, Central or South America.¹⁵ For individual HCW to survive in the era of pandemic, adequate knowledge of the disease that caused the pandemic is required. Such knowledge can help to contain the pandemic by adopting right precautionary measures, which will invariably boost both the physical and mental health of the individuals.¹⁷ Findings from this study indicated that virtually all respondents are knowledgeable about the COVID-19 and its presence in Nigeria. The knowledge rating showed an average 6.8 point out of 9.0 which is good. A similar study in Nigeria among the general public showed respondents had a mean total knowledge score of 4.17 (SD=0.77) which is above the norm score of 3.17 The source of information in this study revealed most of our respondents got their information from the electronic media such as radio, television which are mostly the traditional sources of information in Nigeria like other low-income countries. The findings in a related study in Nigeria also identified the mass media as the major sources of information about COVID-19 which was similar to a study conducted during the SARS epidemic in

Hong Kong confirmed that the traditional media provided vital information during outbreaks. 18-20

To demonstrate their knowledge of COVID-19 this study found virtually all participants knew that WHO approved the global practices such as Hand washing, covering with nose and mouth mask and social distancing were key to preventing the spread of the virus. This revelation was supported by Bhagavathula et al, Olapegba et al, and Kebede et al where the majority of the HCWs agreed that maintaining hand hygiene, covering the nose and mouth while coughing, and avoiding sick patients could help to prevent COVID-19 transmission. ^{14,17,21} This study expectedly found a strong association between knowledge of respondents and socio-demographic characteristics such as age (α =0.001) and gender (α -0.002) to be statistically significant.

Generally, most participants in this study had a positive perception of the prevention and control of COVID-19. However, discrepancies were identified in the perceptions of different categories of HCWs, a small fraction had poor perception on issues of fatality of COVID-19 infection, eating well and safe handling of cough and disinfecting equipment and hospital once a day prevent infection. A related study among medical students and physicians in United Arab Emirates observed diverse perception among HCWs, if their responses were truly representative of HCWs, this could have adverse consequences on patient care and also on the dynamics of potential COVID-19 outbreaks which could result in delays in the implementation of necessary confinement measures and personal protective equipment, which may increase the burden of COVID-19.14 This study also looked at the relationship between perception and sociodemographic variables and found a statistically significant association between age (α=0.001), gender (α =0.001) and years of experience (α =0.042). This finding is good to reinforce the need for early preventive and interventional measure among all cadres of HCWs in the facility.

Finally, a large proportion of our respondents showed high tendency to self-safe practices such as the use of N95 facemask especially during procedures, wearing of complete and appropriate PPEs, reporting suspected/ probable case immediately to NCDC. Similar findings was reported in KSA where more HCWs were eager to apply infection control measures since the onset of MERS-CoV although, almost two thirds of their respondents were unaware of guidelines or protocols for the care of patients with MERS-CoV infection and among Chinese residents during the rapid rise of COVID-19 infection.^{22,23} Another major finding among our respondents is the differential availability of PPE in all units such a limited supply of goggles, face shield and respirators during the key informant interview, the participants also lamented the lack of regular training on COVID-19. Quite a number of the participants resulted to colleagues or social media to ensure information update on infection transmission and prevention modalities.

CONCLUSION

COVID-19 infection continues to pose great threat to individuals and nations globally with rising mortality and morbidity. As Nigeria enters the community transmission phase of the disease there's a need to increase awareness, perception and safety precaution among health care workers who may likely face the risk of infection from patient who attend healthcare facilities. This study identified a significant gap in information source, differential knowledge levels especially among the lower cadre staff, and discrepancies in perceptions of COVID-19. Information were basically obtained through electronic and social media with only a fraction getting information through colleagues at work. Perception was also high on the fatality of COVID-19 and need to ensure wearing of face mask, reporting suspected/probable cases to appropriate authorities which could have predicted the practice of frequent hand washing and avoidance of handshaking. Despite the desire to using PPE most respondents complained of inadequate availability and need to ensure regular training of all cadre of staff on infection transmission, prevention and precautionary measures to limit COVID-19 transmission.

Recommendations

We hereby recommend the following to further enhance the fight against COVID-19 within the health facility, intensify risk communication and information dissemination through regular training on infection transmission, preventive measures and constant use of PPEs while making contact with any patient within the health facility among all cadre of health staff. Adequate supply of PPEs to all units within the health facility and monitoring its mandatory use in order to reduce infection transmission among healthcare workers.

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