



Coronavirus Disease (COVID-19) Pandemic: Analysis of the Knowledge, Attitude and Practice among Healthcare Facilities in Jos, Nigeria

**Maryam Shehu^{1*}, Hassan Shehu², Abel B. Izang³, Oseni Momodu²,
Abraham Owokolo⁴, Sekyen Sana³ and Edwin E. Eseigbe¹**

¹*Department of Paediatrics, College of Medicine and Health Sciences, Bingham University/Bingham University Teaching Hospital, Jos, Plateau State, Nigeria.*

²*Department of Surgery, College of Medicine and Health Sciences, Bingham University/Bingham University Teaching Hospital, Jos, Plateau State, Nigeria.*

³*Department of Family Medicine, Plateau State Specialist Hospital, Jos, Plateau State, Nigeria.*

⁴*Department of Surgery, Bingham University Teaching Hospital, Jos, Plateau State, Nigeria.*

Authors' contributions

This work was carried out in collaboration among all authors. Authors MS and HS designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors OM and EEE managed the analyses of the study. Authors ABI, SS and AO managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Background: COVID-19 which was first reported in Wuhan China is now a global pandemic. Healthcare workers play a significant role in fighting this pandemic. The aim of this study is to assess the knowledge, attitude and practice (KAP) of COVID-19 among healthcare professionals in Jos.

*Corresponding author: E-mail: maryamshehu1405@gmail.com, maryamyaks@yahoo.com;

Methodology: The study population are all the health workers in Bingham University Teaching Hospital (BHUTH), Plateau State Specialist Hospital (PSSH) and ECWA comprehensive health care center (ECHC) in Jos who consented to the study. Consecutive sampling was employed in selecting eligible workers who consented to the study. Data generated was subjected to descriptive and inferential statistics as appropriate.

Results: There were 446 HCWs, in comparing the overall mean knowledge score regarding COVID-19 between the different cadre of clinical HCWs, the difference was significant ($F= 5.23$, $p= 0.002$). The overall mean knowledge score between the different cadre of non-clinical HCW was not statistically significant ($F= 1.38$, $p= 0.26$). There was no significant difference between the mean scores of KAP of the doctors in the different hospitals in Plateau State ($F= 0.46$, $p= 0.63$; $F= 0.34$, $p= 0.71$; $F=0.41$, $p= 0.66$) respectively. The result showed a significant association between job cadre with KAP.

Conclusion: The KAP of the HCW was good, however, there was a significant difference between the knowledge scores of the different cadre of clinical HCW in Plateau State. There was also a significant association between the different job cadre with KAP of the HCW.

Keywords: Attitude; COVID-19; healthcare workers; knowledge; practice.

1. INTRODUCTION

The Coronavirus disease 2019 which was shorten to Covid-19, is caused by a novel coronavirus that was detected in December 2019 in Wuhan China [1]. Coronaviruses are a group of positive-sense RNA viruses that are under the Coronaviridae subfamily. They mainly cause respiratory symptoms in humans and gastroenteritis in other animals [2-3].

There were six coronaviruses that were known to affect humans before 2019, out of which two have caused severe epidemic in the last two decades: The severe acute respiratory syndrome coronavirus (SARS-CoV) caused the 2002-2003 SARS epidemic with a 10% mortality rate, the animal source was later traced to civet cats as the intermediate host and horseshoe bats as the primary host in China, the second was the Middle East respiratory syndrome coronavirus (MERS-CoV) in 2012 caused the MERS pandemic with a mortality rate of 37%, the animal source was said to be the dromedary camels [4-7].

The seventh Coronavirus that causes disease in humans was discovered in Wuhan City in China late 2019. The novel Coronavirus was called SARS-CoV-2 because when it was sequenced it was observed to share more than two-thirds of its genetic sequence with SARS-CoV of the 2002-2003 epidemic [8-9].

The disease which was first noticed in China in December 2019 has spread to over 200 countries, 27 territories and involving all the six continents of the world, just few months from the onset of the outbreak of the disease. The

situational report from WHO as at 4th October 2020, showed that, in the western Pacific region where it started, the total number of cases and deaths per million is 108 and 2 respectively. The country with the highest number of cases and deaths per million in the Western Pacific is Philippines with 2,914 and 52 respectively. In South East Asia, the cases and deaths per million are 1,272 and 21 respectively, while the country in the region with the highest number of cases and deaths per million is India with 4746 and 74 respectively. The number of cases per million in Europe is 905 and the number of deaths per million is 35. India, a country in that region has a 4,746 cases per million and 74 deaths per million which is much higher than the regional average [10].

The Eastern Mediterranean region had Iraq leading with 351/million cases and 232/million deaths. The United State of America leads the American region with 21,922/million cases and 626/million deaths. In Africa, the number of cases per million is 181, while deaths per million is 4. South Africa is the country with the highest number of cases per million with 11,461, highest cases of deaths per million with 286/million. Nigeria as at 4th of October has reported 59,000 cases, which translates to 288/million and 5/million deaths [10].

The Novel Coronavirus Pneumonia Emergency Response Epidemiology Team in China that studied the epidemiology of the disease found out that more males were infected than females, with a Case fatality rate (CFR) of 2.8% and 1.7% respectively among males and females. The age group 30-79 years were the most affected, the

overall case fatality rate was 2.3%, however, this increased to 14.8% in those 80 years and above, it was 6.3% in those with background chronic respiratory and 10.5% in those with cardiovascular problems. The disease was asymptomatic in 1.2%, 85.9% had mild disease, 13.8 had severe disease and 5% had critical disease [11-12]. COVID-19 has a wide range of presentation, from asymptomatic carriers to mild, moderate and severe disease presentation.

Li et al, obtained a mean incubation period for the disease to be 5.2 days, (95% confidence interval, 4.1 to 7.0 days), while studies done by Backer et al and Linton et al indicated mean incubation period of 6.4 days (95% CI, 5.6 to 7.7 days), with a range of 2.1 to 11.1 days and 5.0 days (CI, 4.4 to 5.6 days), with a range of 2 to 14 days respectively [13-15]. These estimates of the incubation period are in line with that provided by WHO and ECDC 0 to 14 days and 2 to 12 respectively [16].

COVID-19 most common symptoms are said to be fever, cough, shortness of breath, while headache, diarrhoea, haemoptysis, catarrh and productive cough are symptoms that are not commonly seen. Anosmia is also another uncommon symptom [17-19]. Data obtained from the study done by Guan et al, on the clinical characteristics of COVID-19 in China showed fever as the most common symptom with 88.7% of patients who were hospitalized, cough 67.8% and the least was diarrhoea with 3.8% [20]. Another study done by Huang et al also in China obtained fever in 98% of patients with COVID-19, cough 76%, myalgia/fatigue in 44%, dysnea in 55%. Other symptoms like sputum production, headache and diarrhoea were seen in 28%, 8% and 3% respectively. Investigation results showed lymphopenia in 63% of the patients [19].

Those with mild disease come down with symptoms of an upper respiratory tract viral infection like mild fever, dry cough, sore throat, nasal congestion, malaise, headache or myalgia, they recover within few days, cough and shortness of breath is seen in those with moderate disease while those with severe and critical disease come down with severe pneumonia, respiratory failure, ARDS, sepsis/septic shock and or multiple organ dysfunction (MOD) or failure (MOF) [12]. Other complications include anaemia, acute cardiac injury and secondary bacterial infection [19].

The specimen that could be used to test for the virus includes: bronchoalveolar lavage fluid specimens, sputum, nasal and pharyngeal swabs, faeces and blood [21-22]. The specimen with the highest positive rate of 93% was bronchoalveolar lavage fluid, followed by sputum with 72%, nasal swabs was 63%, while blood had the lowest with 1% [23].

The treatment for patients with COVID-19 is mostly supportive as no cure nor vaccine has been found [24]. Cao et al, observed no benefit for the specific treatment of the disease with lopinavir-ritonavir treatment beyond standard care on hospitalized adult patients with severe Covid-19 [25]. Liu et al, has done an in vitro trial to the efficacy of Chloroquine sulphate as a treatment against COVID-19 [26]. There are about 795 clinical trials investigating potential therapies for COVID-19, of which nearly 500 are interventional trials as of 24th April. However, only about 20 have shown some promising clinical results, although none has been fully approved for specific treatment [27].

The fact that there is no cure for the disease makes prevention of paramount importance. The WHO and CDC says basic preventive methods includes, handwashing and the use of alcohol based hand sanitizers, using disinfectant solutions to clean surfaces, coughing and sneezing into elbow, avoid touching eyes, nose and mouth, wearing a mask when you have a cold, maintaining a social distance of at least 1 meter, staying at home when it is not important to leave the house [28-30].

For those with fever, cough and difficulty in breathing, it is advised that they seek medical help early. The healthcare workers are expected to use personal protective equipment always in attending to suspected cases of COVID-19. The use of N-95 mask is advised when performing aerosol generating procedures on patients [28,30].

The spread of COVID-19 has been very fast and affected all the continents of the world. There is an urgent need to curb the spread of this disease. Studies have shown that the knowledge of HCW concerning COVID-19 affects their attitude and practice [31-35]. This study is aimed at assessing the knowledge, attitude and practice of health workers in Jos about COVID-19.

2. METHODOLOGY

Study Design: Cross-sectional descriptive study

Study Population and Location: Healthcare workers (HCWs) in Bingham University Teaching Hospital (BHUTH) which operates a tertiary level of care, Plateau State Specialist Hospital (PSSH), which operates a secondary level of care and ECWA Comprehensive Healthcare center, a primary level of care, all in Jos, Plateau State.

Study Duration: April 2020- May 2020

Subject and selection methods: The sampling method were a stratified multi-stage proportionate sampling of health care workers in each of the three health care facilities (HCF). The first stage was to proportionately sample the number of HCW in each HCF, which led to the sampling of 211 workers from PSSH, 205 from BHUTH and 30 from ECHC. The second stage was the proportionate sampling of the clinical and non-clinical health care workers in each of the facilities: PSSH clinical HCW and non-clinical HCW were 109 and 99 respectively; BHUTH clinical and non-clinical HCW were 138 and 65 respectively and ECHC had 16 clinical HCW and 14 non-clinical HCW. The third and final stage was a consecutive sampling of the clinical and non-clinical health workers in each of the three health facilities. In each of the health facility a consecutive sampling of all the workers was done until sample size was obtained.

2.1 Sample Size Calculation

$$N = Z^2 P(1-P)/d^2$$

Description:

N = required sample size

Z = confidence interval at 95% (standard value of 1.96)

P = estimated p value of 50%

d = margin of error at 5% (standard value of 0.05)

The calculated sample size was 384 workers.

The total sample size collected was 446.

2.2 Data Collection

Data collection, which entail informed consent process and questionnaire administration was self-administered to each participant that consented to the research. In each of the HCF,

the proportionate formular was used to ensure the appropriate distribution of the participants sampled in each cadre.

Using the proportionate formular: $\frac{A}{B} \times C$

Where:

A= Total number of workers in one hospital/cadre

B= The combined total of workers in the three hospitals

C= The calculated sample size.

The questionnaire had questions on demographic data which included age, sex, religion, tribe, level of education and job cadre; questions on their knowledge about the origin, clinical features and treatment of the disease; questions on their attitude and practice towards preventive methods on Covid-19.

2.3 Questionnaire Validation

The face validity of the questionnaire was conducted by experts in the field and a pilot study on a subset of the population was carried out.

2.3.1 Inclusion criteria

- All workers identified by valid Identity card in BHUTH Jos who consented to the study.
- All workers identified by valid Identity card in PSSH Jos who consented to the study.
- All workers identified by valid Identity card in ECWA CHC Jos who consented to the study.

2.3.2 Exclusion criteria

- Health care workers in other facilities
- Workers who do not consent to the study.

2.3.3 KAP score calculation

There were twelve questions to assess the knowledge of HCW, nine questions for attitude and six questions for practice. Two marks were assigned to each correct response, 1 point for I don't know and 0 point for incorrect answers for the questions on knowledge, attitude and practice. The maximum score for knowledge, attitude and practice were 24, 18 and 12 respectively. The mean score was calculated by summing up all the correct responses and divided by the total number of HCW of each category that responded.

2.4 Statistical Analysis

Statistical analysis was done using SPSS version 20.0. Parametric data was expressed as means and standard deviations. Results was presented in tables. A p-value of less than 0.05 will be considered statistically significant in comparative analysis.

3. RESULTS

A total of 446 healthcare workers from three healthcare facilities in Jos participated in the study. The male to female ratio was 1:1.2, majority of the participants were from the age group of 31-40 years with 28%. Among the participants, the highest frequency of level of

education was diploma with 33%. As seen in Table 1.

In comparing the overall mean knowledge score regarding COVID-19 between the different cadre of clinical HCW, the difference was significant (F= 5.23, p= 0.002). The mean attitude score of the doctors was higher with 14.71±2.64, while the Pharmacist had the least mean score with 12.00±5.66 Table 2.

The non-clinical staff mean score for knowledge and practice between the different cadre did not differ significantly (F=1.38, 0.26; F= 2.20, p= 0.09). However, there was a significant difference in the mean score of attitudes between the different cadre (F= 5.26, p= 0.002) Table 3.

Table 1. Demographic distribution of healthcare workers in Plateau State

Variable	Frequency	Percentage
Sex		
Male	196	43.9
Female	227	50.9
No response	23	5.2
Total	446	100.0
Age group		
<30	100	22.4
31-40	127	28.5
41-50	94	21.1
>50	53	11.9
No response	72	16.1
Total	446	100.0
Education		
FSLC	15	3.4
SSCE/WASC	71	15.9
Diploma certificate	147	33.0
B.Sc	59	13.2
BNSc	45	10.1
MBBS/College Fellowship	73	16.4
Master's Degree	10	2.2
No response	26	5.8
Total	446	100.0
Job in the hospital		
Doctor	79	17.7
Nurse	135	30.3
Pharmacist	15	3.4
Nurse aide/Pharm tech	28	6.3
Admin/Acct	27	6.1
Physiotherapy/Lab	44	9.9
Transport/works/security	44	9.9
Attendants/radiology/records	64	14.3
No response	10	2.2
Total	446	100.0

First school leaving certificate=FSRC, Senior School Certificate Examination/ West African School Certificate=SSCE/WASC

Table 2. Comparison of cadre for knowledge, attitude and practice for clinical staff of healthcare workers in Plateau State

Variable	Mean±SD	F	P
Knowledge scores			
Doctor	18.86±2.56	5.218	0.002
Nurse	18.96±1.92		
Pharmacist	18.60±2.38		
Nurse aide/Pharm tech	17.18±2.28		
Attitude scores			
Doctor	14.71±2.64	3.861	0.010
Nurse	14.07±3.62		
Pharmacist	12.00±5.66		
Nurse aide/Pharm tech	12.86±3.00		
Practice scores			
Doctor	9.49±2.65	1.856	0.138
Nurse	8.74±2.72		
Pharmacist	8.40±2.75		
Nurse aide/Pharm tech	8.43±2.90		

Table 3. Comparison of cadre for knowledge, attitude and practice for non-clinical staff of healthcare workers in Plateau State

Variable	Mean±SD	F	P
Knowledge scores			
Admin/Acct	18.41±2.41	1.338	0.264
Physiotherapy/Lab	18.66±2.42		
Transport/works/security	17.95±2.00		
Attendants/radiology/records	17.83±2.40		
Attitude scores			
Admin/Acct	13.48±3.17	5.256	0.002
Physiotherapy/Lab	13.00±3.82		
Transport/works/security	11.50±3.14		
Attendants/radiology/records	10.88±3.67		
Practice scores			
Admin/Acct	7.70±3.02	2.197	0.090
Physiotherapy/Lab	8.41±2.00		
Transport/works/security	6.95±2.97		
Attendants/radiology/records	8.06±3.09		

Table 4. Comparison of knowledge for cadre by different hospitals in plateau State

Variable	BHUTH Mean±SD	PSSH Mean±SD	ECWA Mean±SD	F	P
Cadre					
Doctor	19.09±2.35	18.53±2.84	18.86±2.56	0.459	0.633
Nurse	18.91±1.73	18.98±2.15	18.96±1.92	0.024	0.976
Pharmacist	19.40±1.52	18.20±2.70	18.60±2.38	0.420	0.661
Nurse aide/Pharm tech	17.10±1.81	11.00±0.00	17.18±2.28	4.230	0.020
Admin/Acct	19.11±1.72	16.57±3.26	18.41±2.41	3.064	0.056
Physiotherapy/Lab	18.67±2.18	18.67±2.62	18.66±2.42	0.000	1.000
Transport/works/security	17.79±1.58	17.96±2.295	17.95±2.00	0.042	0.959
Attendants/radiology/records	18.08±2.33	17.40±2.45	17.83±2.40	0.641	0.528

There was no significant difference between the mean knowledge score of the doctors in BHUTH, PSSH and ECHC (F=0.046, p=0.63), although the doctors in BHUTH had the highest score of 19.09±2.35. However, there was a significant difference in the knowledge score between the different hospitals Nurse aide/Pharm tech job cadre with a p-value 0.02 Table 4.

The mean attitude score of the HCW from the different hospitals were good, with the average mean of 14 out of the 18 points for the Doctors and Nurses. The pharmacist and the nurse aide/Pharm Technicians from PSSH had the lowest mean with 10.60 and 8.0 respectively. There was a significant difference in the attitude of non-clinical HCW between the hospitals: Physiotherapy/Lab with p value of 0.012, Transport/works/security with a p value of 0.020 and Attendants/radiology/records with p value of 0.014 Table 5.

The practice of the HCW was good with doctors and nurses from all the hospitals having an average mean score of 9.01 out of 12, While the

average practice score of the nurse aides/pharmacist technicians from the different hospitals was 6.59. There was a significant difference between the practice of the nurse aides/pharmacist technicians and Transport/works/security compared between the hospitals. The average mean score in PSSH was 6.15 which was the lowest Table 6.

There was a significant association between knowledge and the different Job cadre of hospitals workers with F value of 3.691; p=0.001. There was also a significant association between the attitude of the HCW and their different Job cadre, F=9.309; p=0.000. The practice of the HCW was also significantly associated with their Job, F=4.135; p=0.000 Table 7.

The knowledge, attitude and practice of the HCW was not significantly related to sex with T-test and p values of (0.410, 0.662, 0.014 and 0.522, 0.416 and 0.907) respectively. Although, the male sex had higher mean scores than the females in knowledge and attitude Table 8.

Table 5. Comparison of attitude for cadre by different hospitals

Variable	BHUTH Mean±SD	PSSH Mean±SD	ECWA Mean±SD	F	P
Cadre					
Doctor	14.91±2.09	14.41±3.26	14.71±2.64	0.338	0.714
Nurse	14.53±3.38	13.59±3.91	14.07±3.62	1.094	0.336
Pharmacist	14.80±1.10	10.60±6.54	12.00±5.66	0.948	0.400
Nurse aide/Pharm tech	13.81±2.36	8.00±0.00	12.86±3.00	2.521	0.091
Admin/Acct	13.16±3.42	14.29±2.69	13.48±3.167	0.316	0.730
Physiotherapy/Lab	16.44±1.67	12.13±3.93	13.00±3.82	4.701	0.012
Transport/works/security	13.43±3.08	10.59±2.70	11.50±3.14	4.119	0.020
Attendants/radiology/records	12.32±3.64	9.54±3.36	10.88±3.67	4.430	0.014

Table 6. Comparison of practice for cadre by different hospitals

Variable	BHUTH Mean±SD	PSSH Mean±SD	ECWA Mean±SD	F	P
Cadre					
Doctor	9.73±2.42	9.18±2.96	9.49±3.65	0.411	0.663
Nurse	8.53±3.01	8.91±2.42	8.74±2.72	0.319	0.727
Pharmacist	9.60±0.89	7.80±3.19	8.40±2.75	0.728	0.492
Nurse aide/Pharm tech	9.33±2.03	2.00±0.00	8.43±2.90	4.203	0.021
Admin/Acct	7.89±3.02	7.71±3.15	7.70±3.02	0.024	0.977
Physiotherapy/Lab	9.33±2.00	8.40±1.99	8.41±2.00	0.846	0.425
Transport/works/security	8.71±2.02	6.15±3.18	6.95±2.97	3.582	0.032
Attendants/radiology/records	9.20±2.58	7.26±3.36	8.06±3.09	2.910	0.058

Table 7. The association between knowledge, attitude, practice and Job description

Variable	Mean±SD	F	P
Knowledge			
Doctor	18.86±2.56	3.691	0.001
Nurse	18.96±1.92		
Pharmacist	18.60±2.34		
Nurse aide/pharmacist technician	17.18±2.28		
Admin/accountant	18.41±2.41		
Physiotherapy/lab scientist	18.66±2.42		
Transport/Works/Security	17.83±2.40		
Attendants/radiographers	18.48±2.30		
Attitude			
Doctor	14.71±2.64	9.309	0.000
Nurse	14.07±3.62		
Pharmacist	12.00±5.66		
Nurse aide/pharmacist technician	12.86±3.00		
Admin/accountant	13.48±3.17		
Physiotherapy/lab scientist	13.00±3.82		
Transport/Works/Security	11.50±3.14		
Attendants/radiographers	10.88±3.67		
Practice			
Doctor	9.49±2.65	4.135	0.000
Nurse	8.74±2.72		
Pharmacist	8.40±2.75		
Nurse aide/pharmacist technician	8.43±2.90		
Admin/accountant	7.70±3.02		
Physiotherapy/lab scientist	8.41±2.00		
Transport/Works/Security	6.95±2.92		
Attendants/radiographers	8.06±3.09		

Table 8. The association between knowledge, attitude, practice of HCW and gender

Variable	Mean±SD	T-test	P
Knowledge			
Male	18.59±2.28	0.410	0.522
Female	18.42±2.21		
Attitude			
Male	13.70±3.44	0.662	0.416
Female	13.11±3.58		
Practice			
Male	8.48±2.84	0.014	0.907
Female	8.59±2.80		

The age group of 31-40 years had higher mean scores in knowledge than the other age groups, however, the difference was not significant. The age group < than 30 years had the higher mean score in attitude Table 9.

4. DISCUSSION

The findings in this study showed that HCWs in Plateau State have a good level of knowledge, attitude and practice towards COVID-19 pandemic. Doctors, nurses and pharmacist were

found to have a higher mean knowledge scores compared to nurse aide/pharmacist technicians among the clinical HCW. This could be explained by the fact that among the clinical HCW, the doctors, nurses and pharmacist have higher education translating to a better knowledge compared to the nurse aides/pharmacist technicians. The doctors and nurses are also regularly and constantly engaged in the direct treatment of patients, so searching and trying to acquire knowledge on how to improve the conditions of their patients is expected of them.

Table 9. The association between knowledge, attitude, practice of HCW and age

Variable	Mean±SD	F	P
Knowledge			
<30	18.44±2.39	0.351	0.788
31-40	18.58±2.21		
41-50	18.35±2.48		
>50	18.23±2.33		
Attitude			
<30	13.50±3.81	1.323	0.267
31-40	13.26±3.74		
41-50	12.47±3.93		
>50	12.94±3.86		
Practice			
<30	8.28±2.62	0.338	0.798
31-40	8.54±2.92		
41-50	8.32±2.83		
>50	8.68±2.96		

Among the non-clinical HCW, the admin/accounts and physiotherapist/lab technicians had better mean knowledge scores compared to the transport/security/works and attendants/radiographer/records. A plausible explanation is because, correspondingly among the non-clinical HCW, the admin/accounts and physiotherapist/lab workers have higher education and training than the transport/works/security and attendants/radiology/records.

The mean attitude scores of the doctors and Nurses were higher than the pharmacist and nurse aide/pharmacist technicians among the clinical HCW. In similar manner, the admin/accounts and physiotherapy/lab had higher mean attitude scores compared to transport/works/security and attendants/radiology/records among the non-clinical HCW. A plausible explanation for these finding could be because a good knowledge will always translate to good attitude as seen by different studies [31-35].

In comparing the mean practice scores among the clinical HCW, the doctors had a better score compared to the nurses, pharmacist, nurse aide/pharmacist technician. This is similar to what was obtained by Al-Sulayyim and Zhang et al [33-34]. This is different from what was obtained by Nepal et al, where the health assistants had better practice scores than the doctors and nurses, although the difference was not significant [32]. The doctors however had better knowledge scores than the health assistants which was significant. The physiotherapist/lab and attendants had better practice scores compared to the admin/accounts

and transport/works/security. This could be because the physiotherapist/lab, attendants/radiologist/records have greater contact time with patients than the other non-clinical HCW.

However, it is worthy to note that COVID-19 is a novel disease and therefore have not been taught in any medical and non-medical educational institutions. Therefore, the knowledge that the clinical and non-clinical staff have were derived from personal research and additional learning programmes from the internet and seminars.

There was no significant difference between the mean knowledge score of the doctors in BHUTH, PSSH and ECHC ($F=0.046$, $p=0.63$), although the doctors in BHUTH had the highest score of 19.09 ± 2.35 . This could be because, BHUTH and PSSH are all COVID-19 designated hospitals in the state. Although, ECHC is not a designated hospital for COVID-19, but it is affiliated to BHUTH. The mean attitude score of the HCW from BHUTH and ECHC hospital were good. However, nurse aide/Pharm technicians from PSSH had mean scores just a little above average. The difference in the attitude scores between same cadre of clinical HCWs like the nurse aid/pharmacist technicians from the different hospitals and most of the non-clinical HCW from the different hospitals could be attributed to knowledge discrepancies between the HCW in the different hospitals. This could be associated with the lack of training on COVID-19 to HCW in PSSH as of the time of writing this report, while some of their counterparts in BHUTH and ECHC had received seminar training on COVID-19.

The knowledge, attitude and practice gaps seen in some of the cadre of HCW between the hospitals could be addressed by a collaborative approach of seminars, workshops and trainings on COVID-19, involving all cadres of clinical and non-clinical HCW from the different hospitals.

There was a significant relationship between the knowledge, attitude and practice of the HCW in Plateau State and their Job description. This is expected because the clinical HCWs like the doctors and nurses that work closely with the patients tend to know and have better practice concerning COVID-19 compared to those whose job description is not closely related with the care of patients. This is similar to what was obtained by Nepal et al. Zhang et al. Huynh et al. and Al Sulayyim et al. where job description showed significant association with the knowledge, attitude and practice [32-35].

Although, the age group 31-40 years had the highest score in knowledge, the age group less than 30 had the highest mean score for attitude. The difference was not significant. The reason could be because these two age groups have the highest frequencies combined together, also, because they are young, they are actively engaged in learning new things. There was also no significant difference between the mean score in knowledge, attitude and practice of males compared to females even though, the males had higher scores than the females. This is similar to what was obtained by Saqlain et al [31].

5. RECOMMENDATION

The Ministry of Health in the state in conjunction with the above-named hospitals should carry out repeated teachings and seminars on COVID-19 to increase the knowledge, attitude and practice of the HCWs in the hospitals.

Extra provision should be made to include the non-clinical HCW in the teachings and seminars as it relates to their work in the hospital and the community in general.

6. CONCLUSION

The knowledge, attitude and practice of HCW in plateau State on COVID-19 was good, however, the clinical and professional HCW did better than the non-professional clinical and non-clinical HCW. There is the need to include all cadres of

clinical and non-clinical HCW in the training on COVID-19.

ETHICAL APPROVAL AND CONSENT

Ethical approval was obtained from the Health Research Ethics Committee (HREC) of BHUTH and the HREC of PSSH and ECHC consented to the approval from BHUTH, Jos. As per international standard or university standard guideline participant consent has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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