

Original Research Article

Knowledge, perception and practices regarding novel coronavirus among sample of Ghanaian healthcare workers: a cross-sectional study

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ABSTRACT

Background: Healthcare workers' have increased risk of contracting the deadly COVID-19 pandemic due to their exposures to infected persons and their specimens. Ghana, like many other countries, has felt the devastating effects of this virus; it was therefore prudent to assess the levels of knowledge, perception and practice of Ghanaian healthcare providers on the current pandemic.

Methods: This descriptive cross-sectional study enlisted 979 healthcare workers' in Ghana from 1st Apr to 20th Nov, 2020, via self-reported questionnaire. SPSS version 22.0 was used for the analysis. Responses were summarized using frequency and proportions. A chi-square test was utilized to test for association at significant level of $p < 0.05$.

Results: Out of the 979 healthcare workers recruited, 56.4% had good knowledge and 59.5% displayed good perception on the novel COVID-19 while 63.1% of them effectively practiced the expected precautionary measures. Age ($p=0.001$), gender ($p=0.034$) and profession ($p<0.001$) significantly affected the practice of precautionary measure among the health personnel. The respondents' perceptions towards the pandemic were significantly linked to their age ($p<0.001$), gender ($p=0.043$), profession ($p<0.001$), type of occupation ($p=0.001$) and source of information ($p=0.006$). Also, knowledge significantly related to good practices but did not influence the perception of HCWs.

Conclusions: The current study identifies that more than half of HCWs in Ghana have sufficient knowledge, perception, and practice of precautionary measures; however, it elucidates some significant concerns about the knowledge gap in this COVID-19 outbreak. There is an obvious need for progressive in-service training programs for the health workers to broaden their scopes on the risks and preventive measures.

Keywords: Coronavirus disease 2019, Healthcare workers, Knowledge, Perception, Practice Ghana

INTRODUCTION

First emerging in Wuhan, China, the coronavirus disease of 2019 (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV2).^{1,2} The

causative agent was recognized from samples from the throat swab conducted by the Chinese Centre for Disease Control and Prevention (CCDC) on 7th January 2020 and was afterward named COVID-19 by the World Health Organization (WHO).³ Within a few weeks, the infection

spread worldwide at a rapid pace.⁴ The recent (December 15, 2020) COVID-19 global statistics revealed the new cases and deaths continue to rise with about 70 million cumulative cases and 1.6 million deaths from 216 countries and territories affected.⁵

In Ghana, as of December 16th, 2020, the official number of confirmed cases is 53,386; 1011 active cases, 116 new cases and 327 deaths.⁶ The WHO report revealed the mortality rate to be between 3-4%; however, Baud et al, (2020), revealed that it appears that the mortality statistics are underestimated.^{4,7}

The transmission of COVID-19 poses a risk for individuals who come in close association with infected persons, and the risk is higher among those in close proximity to or work near the patient.^{8,9} Our healthcare workers (HCWs) are exposed to pathogen, stress, psychological distress, fatigue, occupational burnout and stigma, and physical violence in response to COVID-19 pandemic.^{8,10}

Globally at least 22,000 HCWs have been infected with COVID-19, at the time of the report, with Italy reporting the highest percentage (20%).¹¹ In a dental context, due to the proximity of dentists and their devices to the patient, the risk of contracting the infection from the micro-droplets of an infected patient is high and also the possibility of cross-transmissions.⁹ A study conducted in China by 12 identified 26 orthopaedic surgeons with COVID-19 from 8 hospitals in a survey of orthopaedic surgeons in Wuhan.

Approximately 79.2% got exposed in the general ward while 20.8% got it in public places within the hospital, 12.5% in the operation theatre, 4.2% in intensive care units, and 4.2% got exposed in the outpatient clinic. The knowledge of a disease can impact HCWs' perception and practices, and poor perception and practices directly increase the risk of infection.¹³ Hence, a good knowledge, perception and risk perception is pivotal in handling the condition at level HCWs in health facilities.

Previous studies on knowledge, attitude and practice (KAP) in Asian countries reported that HCWs have satisfactory level of knowledge and a positive attitude towards the COVID-19 outbreak.^{8,14,15} Meanwhile, Bhagavathula et al., (2020) study revealed that HCWs have inadequate knowledge about COVID-19 but indicated positive perceptions of the prevention of COVID-19 transmission.¹⁶

The findings from similar studies conducted in African however shows otherwise. For instance, a study in Uganda reported sufficient knowledge for HCWs but relatively poor attitude among HCWs toward COVID-19.¹⁰ Also, a research from Ethiopia reported, poor knowledge and erroneous assumptions of healthcare professionals, during the Ebola virus outbreak in 2015

and it proposed intense training of the healthcare professionals.¹⁷

Ghana's COVID-19 cases are on its ascendancy and poses an imminent threat to the general populace and HCWs. Serwaa et al, (2020) ascertained that the overall knowledge about the COVID-19 outbreak among the Ghanaians population was 61.7%.¹⁸ Even though Nkansah et al., (2020) recently concluded that two-thirds (65.1%) of HCWs possess adequate knowledge on the COVID-19 pandemic, their study was limited to only one district in Ghana and had a smaller sample size as well.¹⁹ This study was therefore destined to assess HCWs knowledge, perception and practice with regard to the current COVID-19 pandemic in the entire country.

Investigation into the factors that influence the perception and behaviour HCWs will assist stakeholders to organize the necessary educational programs in order to provide up-to-date information about best practice to the control and protection against the COVID-19. Aside contributing to existing evidence on KPP the findings from this study can also guide HCWs in prioritizing protection and preventing occupational susceptibility and consequently inform suitable training and policies during the coronavirus outbreak.

METHODS

Study design

An online cross-sectional study of HCWs knowledge, perception and practices toward COVID-19 outbreak in Ghana was conducted between 1st April and 20th November, 2020. We adopted this snapshot method using google forms via electronic platforms in order to meet the objective of the study, limit physical contact with respondents and get responses quickly as far as possible amidst outbreak.

Study population

Identified HCWs included clinicians, nurses, midwives, pharmacists, biomedical scientists, community health works and other healthcare providers practicing in both private and public health facilities in Ghana. We involved HCWs who were aged 18 years and above in the study after an informed consent. Any HCWs aged below 18 years or either too busy or not interested were excluded.

Minimum sample size

We estimated the minimum sample size using the Cochran formula 20 and based on the information from a previous study; given that Z (at 95% confidence interval) =1.96, p (proportion with good practice) =0.74, q (1-p) =0.26, and e (margin of error) =0.05, 296 participants were required. Factoring 10% non-response rate during the study, at least 326 participants were needed for the analysis.

Study procedure

Due to the severity and the spread of the disease coupled with the lockdown in Ghana, we resorted to WhatsApp Messenger, Facebook, and emails for enrolling potential participants at the time of data collection. We used snowball approach to identify known HCWs to share on their WhatsApp platforms while they also identify colleagues to share on other platforms. In all a total of 979 HCWs who were members in the several WhatsApp groups consented to participate in the study.

An online data collection tool was designed and executed using Google Forms (via docs.google.com/forms). Participation in this study was solely voluntary and was conducted in accordance with "Declaration of Helsinki-Ethical Principles for Medical Research" throughout the study.

Study variables

The study instrument was divided into four sections, with each section assessing respectively the socio-demographic characteristics, knowledge, perception and practices of HCWs midst the outbreak. The socio-demographic background of the respondents' included the region of work, and profession.

On knowledge of HCWs related to COVID-19, 12 questions were used to determine the respondent's knowledge. Response for each question was graded as 0 (incorrect answers) and 1 (correct answers). The overall score patients could obtain ranged from 0 to 12. Knowledge scores less than 6 (the median) were classified "poor" knowledge, and scores greater or equal to 6 as "good" knowledge.

On perception of HCWs toward COVID-19, 7 questions with two responses each were used to determine the respondent's perception. Each answer was graded from 0 (false) to 1 (true). The overall score patients could obtain ranged from 0 to 7. An overall score less than 3 was classified poor perception and scores above 3 was classified as good perception.

On practices of COVID-19 prevention measures, 5 questions regarding surgical mask use, hand washing, using soap to wash the hands, using sanitizer and avoidance of face touching were asked. Three options each were provided for each item (every time, sometimes, and never). The overall score patients could obtain ranged from 0 to 15. Scores less than 7 indicated poor practice while scores of 7 and above were rated as a good practice.

Data analysis

Data collected were extracted using Excel version 2016 and imported into IBM SPSS version 22 for analysis. We analyzed data descriptively using frequency and proportions. A Chi-square test (to analyze the factors

influencing knowledge and preventive measures of the COVID-19) was computed with significance level stated as p value. The confidence level was 95% and statistical significance set to be $p < 0.05$.

Ethical consideration

We followed strictly "Declaration of Helsinki-Ethical Principles for Medical Research" throughout the study. The eligible healthcare workers were duly informed of the objectives of the study, and they consented to it before participation. Participants were assured of the confidentiality of the data provided as their responses were anonymous.

RESULTS

This current study recruited a total of 979 health professionals. The ages ranged from 20 to 56 years, with a mean age of 31.64 ± 5.12 years. The majority (582/979, 59.5%) of the respondents were aged 30-39 years and the least were aged 50-59 year (24/979, 2.5%). The female to male ratio was 2:1 (630/348). Of all the health personnel 54.6% (n=534) were nurses, 12.3% (n=120) were biomedical scientists and the minority 3.0% (n= 29) were clinicians. The others (n=144, 14.7%) included health information personnel, disease control officers, health promotion officers, nutrition officer, physiotherapist and technical officers (X-ray) (Table 1).

Table 1: Sociodemographic characteristics of healthcare workers.

Characteristics	Participants (N)	Percentage
Age (years)	Mean=31.64±5.12	min=20 max=56
20-29	336	34.4
30-39	582	59.5
40-49	36	3.7
50-59	24	2.5
Gender		
Female	348	35.6
Male	630	64.4
Profession		
Clinicians	29	3
Nurses	534	54.6
Biomedical scientists	120	12.3
Pharmacists	60	6.1
Community Health Personnel	91	9.3
Others	144	14.7

Greater number of the health workers who participated in the study were from the Ashanti region (n=158), followed by Upper west (n=102), Greater Accra region (n=97) and Western North being the least (n=20) (Figure 1).

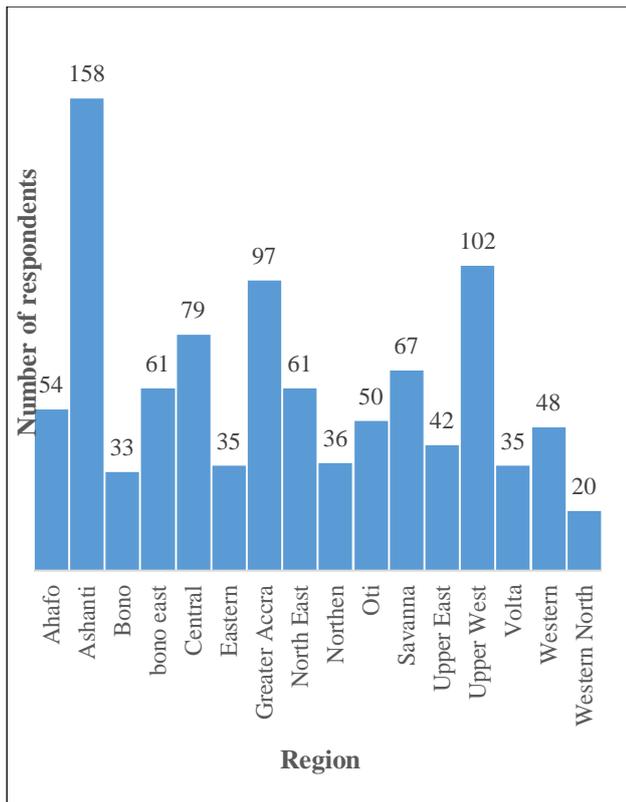


Figure 1: Distribution of the health workers across the region in Ghana.

A total of 56.4% of the health workers had good knowledge on COVID-19 (Figure 2). Almost all (98.8%) of the participants have heard about the COVID-19 pandemic in Ghana and 74.8% of the respondents quoted perfectly the incubation period of the virus (2-14 days).

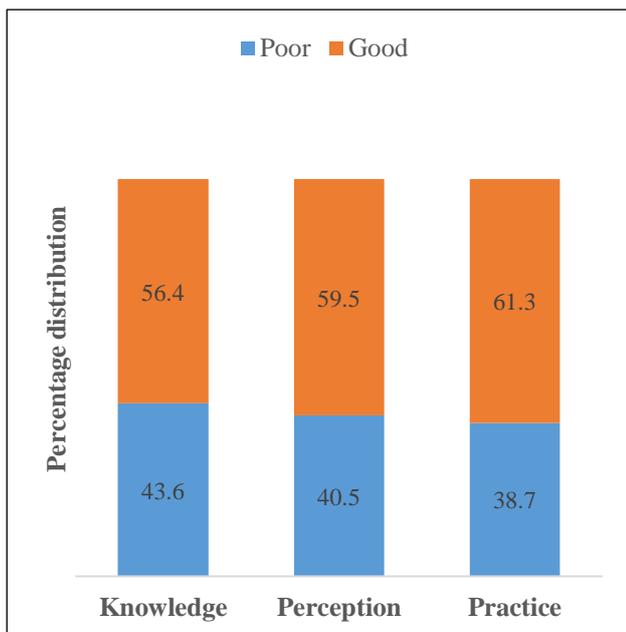


Figure 2: Knowledge, perception and practice among the Health Workers.

All (100%) of the health workers stated accurately identified the symptoms of the disease. Interestingly, only 56.4% believed that the pandemic originated from Bats. Most (77.3%) of the participants stated precisely that the old age people were more at predispose to the infection as compared with the other age groups.

Surprisingly, 55.8% knew the mode of transmission of the virus and 77.3 had full understanding of the complications associated with the infection. Most (77.3%) of the participants cited that the symptomatic treatment is the current practice in Ghana.

Lastly 87.7% had a correct understanding of the ways to reduce COVID-19 transmission (Table 2).

Table 2: Knowledge of Healthcare workers' towards COVID-19.

Statements	N	%
Have you heard of COVID-19?	996	98.8
What is the incubation period of COVID-19?		
Correct	732	74.8
Incorrect	246	25.2
All the following are symptoms of COVID-19 except		
Correct	978	100
Incorrect	0	0.00
COVID-19 is believed to have originated from?		
Correct	552	56.4
Incorrect	426	43.6
Which group of people do you think are more at risk?		
Correct	756	77.3
Incorrect	222	22.7
COVID-19 transmission occur through?		
Correct	432	44.2
Incorrect	546	55.8
What are the complications of COVID-19?		
Correct	756	77.3
Incorrect	222	22.7
What is the current treatment for COVID-19?		
Correct	756	77.3
Incorrect	222	22.7
How to reduce the risk of transmission?		
Correct	858	87.7
Incorrect	120	12.3

The most consulted source of information about COVID-19 were social media (21.50%) followed by official government websites (19.60%) news media were used more often (50.90%) and approximately 37% and 30% of

health personnel indicated that they discussed COVID-19-related topics with family and friends sometimes and once in a while respectively (Figure 3).

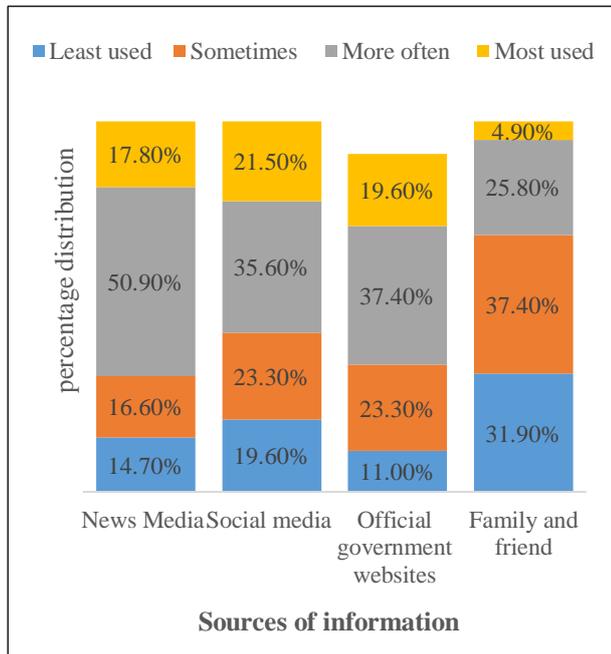


Figure 3: Healthcare workers' source of information about COVID-19.

About 59.5% of the health personnel displayed a good perception of COVID-19 (Figure 2). Approximately 93% of the participants knew that the symptoms of COVID-19 appeared between 2 to 14 days after contact with the virus. A greater number of the participants (98.8%) said it's false to say that if anyone get the COVID-19, there is no possibility of survival.

Also, an appreciable number (93.9%) knew that if anyone who have had a shot of flu vaccine, is not automatically vaccinated against the COVID-19 and that anyone who exhibit signs like fever, cough and difficulty breathing must seek medical care early and previous travel history with the health care with the healthcare provider (96.9%).

However, about 60% of respondents were not sure that proper handling and effective cooking of meat in places experiencing the outbreak is protective of COVID-19.

In addition, nearly 97% endorsed that anyone working in a "wet environment" should disinfect the equipment and working area at least once a day and 88.3% indicated that WHO guidelines for the COVID-19 does not recommend that hands should be washed only when its visibly dirty (Table 3).

Regarding the practice of precautionary measure to avoid being infected with the virus, the minority (48.5%) of the HCWs occasionally wore surgical mask and a greater number (26.4%) touched their face every now. Majority

of HCWs (90.8%) of them frequently washed their hands under running water.

Table 3: Perception of Healthcare workers' towards COVID-19

Statements	True	False
It is believed that symptoms of the COVID-19 may appear in as few as 2 days or as long as 14 after exposure.	912(93.3%)*	66(6.7%)
If anyone get the COVID-19, there is no possibility of survival.	12(1.2%)	966(98.8%)*
Anyone with a shot of flu vaccine, is automatically vaccinated against the COVID-19	60(6.1%)	918(93.9%)*
Even in areas experiencing outbreaks, meat products can be safely consumed if these items are cooked thoroughly and properly handled during food preparation.	918(93.9%)*	60(6.1%)
If anyone has a fever, cough and difficulty breathing seek medical care early and share previous travel history with the health care providers help in diagnosis?	948(96.9%)*	30(3.1%)
Anyone working in a "wet environment" it is recommended to disinfect the equipment and working area at least once a day	840(85.9%)*	138(14.1%)
As per WHO guidelines for the COVID-19, you only need to wash your hands when they are visibly dirty.	114(11.7%)	864(88.3%)*

Similarly, 93.9% of the health workers habitually washed their hands with soap. Approximately 67% of the participants sanitized to their hands often (Table 4). The overall practice of the precautionary measures among the health workers was found to be 63.1% (Figure 2). A weak positive ($r=0.014$) relationship was found between knowledge and perception, however this relationship was not significant.

Table 4: Responses to the Statements on the practice of precautionary measures.

Statements	Responses N (%)		
	Never (%)	Sometimes (%)	Everyday all the times (%)
How often do you practice these precautionary measures?			
Surgical mask use	138 (14.1)	474 (48.5)	366 (37.4)
Washing hands under running	12 (1.2)	78 (8.0)	888 (90.8)
Using soap to wash hands	12 (1.2)	48 (4.9)	918 (93.9)
Using sanitized to disinfect the hands	54 (5.5)	270 (27.6)	654 (66.9)
Not touching the face	72 (7.4)	648 (66.3)	258 (26.4)

A weak positive significant relationship was found between knowledge and practices (r=0.092, p=0.004). In

Table 6: Factors significantly associated with COVID-19 knowledge, perception and practice.

Variable	Knowledge		χ^2	P	Perception		χ^2	P	Practice of precautionary measures			
	Poor N (%)	Good N (%)			Poor N (%)	Good N (%)			Poor N (%)	Good N (%)	χ^2	P
Age (years)												
20-29	108 (32.1)	228 (67.9)	27.136	<0.001	162 (48.2)	174 (51.8)	28.754	<0.001	102 (30.4)	234 (69.6)	16.7	0.001
30-39	288 (49.5)	294 (50.5)			216 (37.1)	366 (62.9)			252 (43.3)	330 (56.7)		
40-49	18 (50.0)	18 (50.0)			18 (50.0)	18 (50.0)			12 (33.3)	24 (66.7)		
50-59	12 (50.0)	12 (50.0)			0 (0.0)	24 (100)			12 (50.0)	12 (50.0)		
Gender												
Female	192 (55.2)	156 (44.8)	29.64	<0.001	126 (36.2)	222 (63.8)	4.114	0.043	150 (43.1)	198 (56.9)	4.51	0.03
Male	234 (37.1)	396 (62.9)			279 (42.9)	360 (57.1)			228 (36.2)	402 (63.8)		
Profession												
Clinicians	5 (17.2)	24 (82.8)	26.45	3	6 (20.7)	23 (79.3)	74.28	<0.001	11 (37.9)	18 (62.1)	48.5	<0.001
Nurses	240 (44.9)	294 (55.1)			270 (50.6)	264 (49.4)			174 (32.6)	360 (67.4)		
BMSs	54 (45.0)	66 (55.0)			42 (35.0)	78 (65.0)			78 (65.0)	42 (35.3)		
Pharmacists	12 (20.0)	48 (80.0)			12 (20.0)	48 (80.0)			30 (50.0)	30 (50.0)		
CHPs	49 (53.8)	42 (46.2)			42 (46.2)	49 (53.8)			37 (40.7)	54 (59.3)		
Others	66 (43.8)	78 (54.2)			24 (16.7)	120 (83.3)			48 (33.3)	96 (66.7)		

the case for perception and practices, a weak negative correlation was observed (r=-0.037, p=0.250) (Table 5). A chi-square test was utilized in the study to examine association between health personnel’s knowledge, perception, practice of COVID-19 and age, gender and profession. A good knowledge of COVID-19 higher among greater proportion of HCWs of age 20-29 years (67.9%), who were males (62.9%), clinicians (82.8%), and pharmacists (80%). HCWs knowledge was significantly different among the levels of age (p=0.001), gender (p=0.001), and profession (p=0.001).

Table 5: Correlation between knowledge, perception, and practices for the HCWs.

Variable	Correlation Coefficient (r)	P value
Knowledge and perception	0.014	0.667
Knowledge and practice	0.092	0.004
Perception and practice	-0.037	0.250

On perception, 100% of the HCWs of age 40-49 years had positive perception toward COVID-19, while females (63.8%), clinicians (80%), and pharmacists (79.3%) were more likely to demonstrate positive perception toward COVID-19. HCWs perception was statistically significant among the levels of age ($p=0.001$), gender ($p=0.001$), and profession ($p=0.001$). The overall practice score indicated good practice among HCWs of ages 20-29 years (69.6%), 40-49 years (66.7%), males (63.8%), nurses (67.4), clinicians (62.1%), and other professionals (66.7%). The practice score was statistically different by age ($p=0.001$), gender ($p=0.034$), and profession ($p<0.001$) (Table 6).

DISCUSSION

The world has heavily felt the devastating effects of the n-COVID-19 since its emergence from Wuhan, China, in December, 2019. Like any other health events, healthcare workers are seen to have an increased risk of infection vis-à-vis their regular encounters with infected persons.^{10,14-16,21} Although not documented, COVID-19 daily briefing by the Ghana Health Service indicated an increasing number of HCWs across most regions in Ghana. In order to revert the high incidence of the infection, healthcare workers' knowledge, perception and practice of measures cannot be underestimated. This study was therefore designed to assess Ghanaian healthcare workers' knowledge, perception and practices (KPPs).

In this study, majority of our HCWs were females, nurses, young adults of age 30 to 39 years and working in the Ashanti region of Ghana. The findings in our study showed that out of the 979 healthcare workers interviewed more than half (56.4%) demonstrated a good knowledge of COVID-19 outbreak. The level of overall knowledge depicted by the respondents in the present study is lower than the observation from the Nkansah et al, (2020) where 65.1% HCWs in Offinso-North district, Ashanti region, Ghana, had sufficient knowledge on the pandemic.¹⁹

Ashanti region was among the few regions to first enrol the training of HCWs in Ghana and this may account for the difference. Previous studies elsewhere by Shi et al., (2020) and Giao, Thi, et al, (2020) found a greater number of healthcare providers with broad knowledge on the current COVID-19 pandemic (89.51% and 88.4% respectively).^{15,22}

Shi et al, (2020) stated that most Chinese health officials had been trained adequately on COVID-19 during the study; but Ghana is now rolling out various workshops to train healthcare professionals to furnish them with up-to-date information on the pandemic.²² This could be a possible explanation for the differences in knowledge scores.

All participants in our study could adequately identify the various symptoms of COVID-19 and this is synonymous

with the Giao et al. (2020) study, unlike a previous study where participants had poor knowledge on the symptoms of SARS.²³ Surprisingly, only 55.8% of healthcare providers in Ghana knew about how COVID-19 is transmitted and how the transmission could be reduced. This is contrary to the findings of Giao et al, (2020) who recorded 98.2% of the participants with exclusive knowledge on how to prevent the transmission of the condition between humans.

Recognizing the modes of transmission and how to prevent them is very crucial in these times considering the surge in the community transmission of COVID-19 in Ghana, vis-a-vis the Government of Ghana's decision to ease the earlier imposed restrictions. Appreciable number of participants in the present study knew that exposed persons could exhibit the symptoms of COVID-19 as early as 2 to 14 days, and this observation is similar to a study by; however, it is worth noting that patients above 70 years had a shorter incubation period of the condition compared to the younger ones.^{16,24}

Most of our study participants recognized the complications associated with the current coronavirus disease, and also understand that the aged are at a greater risk of contracting the infection and suffering from its complications; and this is similar to the findings from the Giao et al., (2020) in Vietnam.¹⁵ Therefore, authorities and healthcare providers need to be extra cautious with patients in the old age group because these patients are more likely to suffer and/or die from the condition. Studies have emphasized the importance of in-service training by health authorities and stakeholders in the quest to provide efficient services to clients, especially during contagious disease outbreak.²⁵⁻²⁷

The authors therefore recommend that authorities organize progressive continuous professional development (CPD) programmes for all healthcare workers to acquaint them with the needed knowledge and skills to handle infectious diseases.

Adequate knowledge was found among HCWs' aged 20-29 years (67.9%), male (62.9%), clinicians (82.8%), and pharmacists (80%). Giao et al (2020) found better knowledge among male HCWs, pharmacists, physicians and those aged 40 years and above.¹⁵ Also, Zhou et al, (2020) reported that doctors showed higher knowledge scores than nurses and paramedics.⁸ We further observed that, age, gender and profession significantly associated with the participants' knowledge on COVID-19 ($p=0.001$); and this is synonymous with the findings from the Giao et al., (2020) where knowledge on COVID-19 significantly associated with profession, even though, there was no association with age and gender.¹⁵

Similar to other studies,^{16,23} our study recorded social media as the primary source mostly utilized by healthcare providers to obtain information regarding COVID-19 followed by official government websites (19.6%), and

the news media (17.8%). This finding is surprising owing to the fact that the Government of Ghana periodically provides updates on the pandemic. The reliance on social media by HCWs is very dangerous in the health fraternity considering that social media quickly spreads unsubstantiated and malicious information which could be fatal and have the potential of leading to xenophobic attacks globally as suggested by scientists and the WHO.^{28,29}

Nevertheless, the Government of Ghana's official websites was the second most used platform by health workers to access information on COVID-19. It is imperative that the Ghana Health Service should regularly update its COVID-19 website to encourage HCWs to access current information on COVID-19 in Ghana and worldwide. On the other hand, Olum and Bongomin reported social media (74%) as the third source of information for their study participant following International health organization (88%) and Government sites and media (79%).¹⁰

In our study, almost two-thirds (59.5%) of HCWs displayed a good perception of COVID-19; similar to the Giao et al. (2020) where over 78% of their healthcare workers exhibited a positive perception of COVID-19.¹⁵ Interestingly, 56.4% in our study believed that the current pandemic originated from Bats and this is similar to the Bhagavathula et al. (2020) where approximately two-thirds of clinicians and half of allied health workers thought that the origin of COVID-19 was bats.¹⁶ Having identified COVID-19 as primarily zoonotic, the greater number of the participants agreed that meat be well-cooked prior to consumption in areas of the outbreak to minimize current spread.

Our participants agreed that there is no vaccine or specific treatment regimen for COVID-19; supportive treatment to limit the symptoms is recommended. Finding specific vaccine or treatment during outbreak of a contagious disease is mostly hard to come by and this was evident in a study where 40% and 57.6% of health workers had no knowledge on treatments for SARS and MERS treatment.^{30,31} However, many allied healthcare providers in the Bhagavathula et al, (2020) study unfortunately believed that specific treatment for COVID-19 is available and that the flu vaccine is sufficient for the prevention of the pandemic, but their medical counterparts believed otherwise.¹⁶

It is only proper, according to our participants, to report early to a health facility to receive supportive treatment once individuals exhibit signs such as fever, cough and difficulty in breathing, and must rightfully healthcare workers of any previous travel history. The WHO confirms that only 5% of COVID-19 patients would exhibit fatalities that would require specialised care.

Our participants subscribe to the assertions by the WHO, as almost all of them (98.8%) understand that there is a

higher chance of survival after contracting the current pandemic.³² Interestingly, more than half of our respondents were not sure that proper handling and effective cooking of meat in places experiencing the outbreak is protective of COVID-19; comparable to earlier study where over a quarter of medical students believed that it was unsafe to eat even well-cooked meat in times like these.¹⁶

However, our participants endorsed that anyone working in a "wet environment" should disinfect the equipment and working area at least once a day. Before COVID-19 outbreak, people wash their hands when perceived to be dirty but a greater number of the healthcare workers in the study now know that the WHO guidelines for the COVID-19 do not encourage washing of hands only when visibly soiled, but rather recommends that effective hand washing must be a regular procedure to halt the transmission of SARs-CoV-2.

Further assessment revealed that, the participants' perceptions towards the pandemic significantly linked to their ages, gender, profession, and type of occupation and their primary channel of receiving information on COVID-19. These findings were consistent with earlier study where occupation/profession was significantly associated with perception ($p=0.001$) but not age ($p=0.151$) and gender ($p=0.129$).¹⁵

The present study showed that 63.1% of the health workers practiced adequate precautionary measures including frequent washing of hands with appropriate soap and under running water (90.8%) and 67% effectively used hand sanitizers. However, less than half of the participants occasionally wore surgical mask and a good number (66.3%) frequently touched their faces with the hands. Touching the face frequently is dangerous as this could promote easy transmission of the infection. The positive perception towards COVID-19 by health workers, is similar to previous studies.^{16,23}

Interestingly, our study identified age ($p=0.001$), gender ($p=0.034$) and profession ($p<0.001$) as factors that significantly affected the practice of precautionary measure among the health personnel. Giao et al. (2020) study however found no association between health workers perception regarding the practice of precautionary measures and age and gender; but found statistically significant association with profession.¹⁵

Our study further assessed the correlation between knowledge, perception and practices, the findings showed that knowledge is significantly related to good practices but do not influence the perception of HCWs. Similarly, findings revealed that perception has not significant relationship with practice.

On the contrary, Saqlain and colleagues found a significant correlation between knowledge, perception and practices, who inferred that HCWs with positive

perception are more interested in seeking knowledge and then put knowledge into practice.³³ These observations indicate that acquisition of accurate and educative information on COVID-19 outbreak, which improves knowledge, are more likely influence good practices among HCWs in Ghana.

CONCLUSION

Our study elucidates some significant concerns about the adequacy of knowledge of Ghanaian healthcare providers on the current COVID-19 pandemic. We found that more than half of HCWs in Ghana have sufficient knowledge, perception, and practice of precautionary measures in this COVID-19 outbreak. Knowledge, perception, and practice were influenced by age, gender and profession among Ghanaian HCWs. There is an obvious need for progressive in-service training programmes for the HCWs to broaden their scopes on the risks and preventive measures; and this would improve their confidence and readiness to provide efficient services to affected individuals and also protect themselves and their relatives.

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