



KNOWLEDGE, ATTITUDE AND PERCEPTION OF HEALTHCARE WORKERS REGARDING COVID-19 AND VACCINE IN ILORIN

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ABSTRACT

This study determined the knowledge, attitude and perception regarding COVID-19 and vaccine among healthcare workers in Ilorin. It was a web-based cross-sectional study conducted for a period of eight weeks in secondary and tertiary healthcare facilities in Ilorin. A total of 2,002 healthcare workers participated in the study. Data on socio-demographics, COVID-19 and vaccine-related concerns were collected. Descriptive and frequency statistics were done. The chi-square test was used to evaluate associations between the categorical variables. P-value was set at <0.05. Ordinal regression was used to assess the determinants of willingness to accept COVID-19 vaccine. The gender distribution showed female preponderance (67.6%) and most participants were married (85.8%). Most common age group was 36-50 years (n=839, 41.9%). Most (61.3%) of the participant got information on COVID-19, COVID-19 vaccine and preventive measures through news and social media. Of the participants, 46.3% used the preventive measures always. Some participants believed these measures help to reduce the spread. Gender as well as other additional factors affected the willingness to receive COVID-19 vaccine. There was high awareness about COVID-19 and fair practice of preventive measures. The willingness to take the vaccine among participants was high. Information about the disease and vaccine were sourced mostly from social media. Thus, healthcare policy makers should take advantage of social media to disseminate appropriate information on COVID-19 and vaccine to improve disease control.

Keywords: Healthcare workers, COVID-19, Vaccines, Perception, Attitude

INTRODUCTION

The coronavirus was first reported in December 2019 in Wuhan, a metropolitan city in China (1, 2) and its emergence caused serious distress on the healthcare systems in all nations across the globe. The virus spread rapidly over a short period to virtually all the countries in the world (2, 3). The virus was named 'Severe Acute Respiratory Syndrome Coronavirus-2' (SARS-

CoV-2) and its associated disease, 'Coronavirus Disease-19' (COVID-19) on 11 February 2020 by the Health Organization (WHO) and was declared a pandemic by the WHO on 11 March 2020 (4, 5).

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This disease is highly contagious and transmission among humans occurs mainly from person to person through either the inhalation or deposition on mucosal surfaces of respiratory droplets, including aerosols produced when sneezing, coughing or speaking. It may also occur indirectly through contact with contaminated objects or surfaces (6).

Upon the emergence of the disease, there were worldwide campaigns to limit the spread through the adoption of COVID-19 preventive measures such as the use of face masks, frequent handwashing, use of hand sanitizers and social distancing (7, 8). Coupled with these measures is also health education on cough hygiene practices like coughing into a handkerchief or into a flexed elbow (8, 9).

Most countries, including African countries, imposed movement restrictions, ranging from partial restriction, phased restriction to a total lockdown in an attempt to curb the spread of the disease. The lockdowns came with unintended consequences such as widening economic inequalities, psychological health issues, and increased poor medical outcomes that are not due directly to COVID-19 (4). The overwhelmed healthcare systems, disruption of other health services and the economic impact of lockdown in this region presented complications that resulted in varying COVID-19 responses in the region (3). The urgency to return back to 'pre-COVID' life, high mortality rate and far-reaching economic disaster from the disease necessitated the development and approval of a vaccine in record time. The primary effect of vaccines generally is to reduce disease burden in terms of morbidity

and mortality. In spite of gains from vaccine technology, there have been some obstacles to its acceptance in different communities. Vaccination is one of the notable public health achievements to have occurred during the 1900s, as it has resulted in eradication of diseases like small pox and control of other diseases like measles.

There are individuals, even associations all over the world, that feel the use of vaccine is an unnecessary exercise in disease control and eradication (10). They express concern about the safety, efficacy, and need for vaccines, a phenomenon known as "vaccine hesitancy" (11, 12). Many reasons have been postulated for vaccine hesitancy but the quickness with which various vaccines became available for the COVID-19 disease and limited data on their safety and efficacy are some of the many sources of concern among the people regarding the vaccines (12 – 14).

The acceptance of these vaccines remains uncertain among the general population including healthcare workers. Some researchers reported that the acceptance of COVID-19 vaccines depended on various economic, social and cultural factors (15) and vaccine hesitancy became an important challenge in the fight against COVID-19 (16, 17).

The knowledge, attitude and perception of healthcare workers (HCWs) regarding COVID-19 and vaccine had not been widely studied and the information on these are scanty in sub-Saharan African countries, including Nigeria. It is well known that healthcare workers constitute an active and important part of the society due to the strategic role they play in

treating patients, training, research and information dissemination.

METHODS

Study Design

It was a web-designed cross-sectional study that used anonymous, self-reported questionnaire with informed consent form. It was shared among the healthcare workers in secondary and tertiary hospital Ilorin, Kwara State, North-central, Nigeria. The study was conducted before the availability of COVID-19 vaccine in the country between January 1, 2021 and February 28, 2021 which gave room for good coverage. The questionnaire was designed and incorporated into the google survey tool and a shareable link was disseminated on social media outlets of the study participants (Facebook and WhatsApp). This was done to limit physical contact and spread of COVID-19.

Study setting

The study setting was General Hospital and University of Ilorin Teaching Hospital that provide secondary and tertiary healthcare facilities respectively to patients in Ilorin metropolis and its environs.

Case Selection/inclusion criteria

All cadre of healthcare workers in the secondary and tertiary healthcare facilities (General Hospital and University of Ilorin Teaching Hospital) in Ilorin who met the inclusion criteria were enrolled into the study. All participants signed an online informed consent form which indicated their interest to participate in the study.

Exclusion Criteria

1. Participants who were below the age of 18 years.
2. Participants with incompletely filled forms.
3. Participants who declined or withdrew consent

Sample size determination

For population less than 10,000 the formula below is used to calculate the sample size.

$$n_f = \frac{n}{1 + \frac{n}{N}}$$

Where: n_f = desired sample size when target population size is less than 10,000

N = the estimated population size (1000)

n = desired sample size when target population is greater than 10,000

$$\begin{aligned} n_f &= \frac{384}{1 + \frac{384}{780}} \\ &= 257.32 \approx 257 \end{aligned}$$

Assuming an attrition rate of 10%

Calculating for 10% Non-response rate

$$\begin{aligned} &= \frac{257}{0.9} \\ &= 285.55 \approx 286 \end{aligned}$$

The minimum sample size was 286 for each healthcare institution. Then for the 2 institutions = $286 \times 2 = 572$

Data analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 24.0 (SPSS Inc., Chicago, IL, USA). Descriptive and frequency statistics were done for the variables studied. The chi-square test was used to evaluate associations between the categorical

variables and p value of <0.05 was statistically significant. Ordinal regression was used to assess the determinants of willingness to accept COVID-19 vaccine.

Ethical consideration Ethical approval was obtained from the Ethics and Research Committee of the University of Ilorin Teaching Hospital with approval number: **ERC PAN/2021/09/191**.

RESULTS

A total of 2,002 participants who met the inclusion criteria were enrolled and included in the final analysis of this study. Of this number, 1353 (67.6%) were females and 649 (32.4%) were males. Fifty-four participants were excluded from the study because of incompletely filled form. The most common age group of the enrolled study participants was between 36-50 years ($n=856$, 42.8%) and this was followed by age group between 51-60 years ($n=795$, 39.7%). The retirement age of healthcare workers is 60 years so there were no participants above the age of 60 years. A large proportion of the study participants were married ($n=1717$, 85.8%) while 183 participants (9.1%) were divorced. Majority of the participants lived in urban areas ($n=1968$, 98.3%) and others lived in rural areas ($n=34$, 1.7%) (Table 1).

On the knowledge and attitude of study participants about COVID-19, the majority believed that the disease was real and affected people ($n=1934$, 96.6%). Sixty-eight participants (3.4%) believed that the disease was not in existence (Table 2).

The source of information about the existence of COVID-19 assessed among the participants

showed that majority got their information from the news and social media ($n=1229$, 61.4%) followed by fellow healthcare workers ($n=455$, 22.7%) (Table 2).

The knowledge and attitude about the preventive measures put in place by the government to reduce the spread of COVID-19 among the participants revealed that some of the participants practiced the preventive measures always ($n=927$, 46.3%) and another group of participants ($n=706$, 35.3%) used these preventive measures only when in crowded area while some of the participants ($n=369$, 18.4%) practiced it sometimes. (Table 2).

Evaluation of the perception of participants on the importance and ability of the preventive measures to reduce the spread of COVID-19 showed that majority of the participants ($n=1870$, 93.4%) believed that the practice of these preventive measures reduces the spread of COVID-19 while some participants ($n=16$, 0.8%) did not believe. Some ($n=116$, 5.8%) were not sure whether the preventive measures could reduce the spread of COVID-19 as shown in Table 2.

Assessment of the level of awareness and perception of the study participants about the COVID-19 vaccine revealed that most participants ($n=1968$, 98.3%) were aware of COVID-19 vaccines. About two-third of the participants ($n=1261$, 63.0%) believed that the vaccine was good and was needed to control the infection (Table 2).

Evaluation of the willingness and intent of the participants to receive COVID-19 vaccine when available showed that the female gender

Table 1: Socio-demographic characteristics of the healthcare workers in Ilorin

Variable	Frequency	Percentage
Age group		
26 – 35	351	17.5
36 – 50	856	42.8
51 - 60	795	39.7
Gender		
Female	1353	67.6
Male	649	32.4
Marital status		
Single	17	0.9
Married	1717	85.8
Divorced	183	9.1
Widowed	85	4.2
Residence		
Rural	34	1.7
Urban	1968	98.3

Table 2: Assessment of knowledge, attitude and perception regarding COVID-19 among healthcare workers in Ilorin

Variable	Frequency	Percent
Awareness		
Yes	1968	98.3
No	34	1.7
Perception		
Good	1261	63.0
Poor	741	37.0
Does COVID-19 Prevention measures help reduce the spread?		
Yes	1870	93.4
No	16	0.8
Not sure	116	5.8
Do you believe there is COVID-19?		
Yes	1934	96.6
No	68	3.4
Source of COVID-19 Information		
Family and friends	17	0.8
Healthcare workers	455	22.7
Public Health Organizations	301	15.0
News and Social media	1229	61.4
Practice of COVID-19 Preventive Measures		
Always	369	18.4
Sometimes	927	46.3
Only in crowded places	706	35.3

Table 3: Ordinal logistic regression model for the intent to accept COVID-19 vaccine among healthcare workers in Ilorin

Variable	Willingness/Intent to receive vaccine			OR (CI)	<i>p</i> value
	No	Not sure	Yes		
Gender					
Female	101 (7.5)	253 (18.7)	999 (73.8)	0.801 (0.580 - 1.107)	0.178
Male	16 (2.5)	84 (12.9)	549 (84.6)		
Age group					
≤50	66 (5.5)	202 (17.0)	922 (77.5)	0.840 (0.640 – 1.101)	0.207
>50	51 (6.3)	135 (16.6)	626 (77.1)		
Marital Status					
Married	84 (4.9)	303 (17.6)	1330 (77.5)	2.012 (1.370 – 2.957)	0.001
Single/Divorced/ Widowed	33 (11.6)	34 (11.9)	218 (76.5)		
Level of Education					
Post-graduate	66 (35.0)	169 (12.7)	1092 (82.3)	1.962 (1.507 – 2.555)	0.001
Tertiary	51 (7.6)	168 (24.9)	456 (67.6)		
Perception					
Good	100 (13.5)	287 (38.7)	354 (47.8)	22.777 (16.632 – 31.192)	0.001
Poor	17 (1.3)	50 (4.0)	1194 (94.7)		

(OR=0.801, CI=0.580-1.107, $p=0.178$) was more willing to take the vaccine. Participants that were 50 years and below were more willing to take the vaccine when it becomes available (OR=0.840, CI=0.640-1.101, $p=0.207$). It was also observed that participants that were married were more willing to take the vaccine compared to other groups (OR=2.012, CI=1.370-2.957, $p=0.001^*$). The level of education was noticed to affect the willingness of participants to receive COVID-19 vaccine, as participants with postgraduate qualifications were more willing (OR= 1.962, CI= 1.507-2.555, $p= 0.001^*$). Participants with good perception of the vaccine were willing to take the vaccine when it becomes available (OR=22.777, CI=16.632-31.192, $p=0.001^*$). (Table 3).

DISCUSSION

This study assessed the knowledge, attitude and perception of HCWs regarding COVID-19 and vaccines. COVID-19 was an important pandemic that affected countries globally, especially with its far reaching effect on healthcare system. Vaccinations are an important part of disease control and eradication in public health (18, 19). Some diseases, through the use of vaccines, have been eradicated worldwide, such as small pox (20). This study is of importance in understanding the epidemiological dynamics of disease control, compliance with preventive measures and success of the vaccination program. It is important to document the potential acceptance of COVID-19 vaccines among the healthcare workers because of their role in patient management and information dissemination in the society. In this study, we found that majority (67.6%) of the healthcare workers were female and the most common age group was between

36-50 years which is comparable to reports by other researchers (21, 22). This study focused on healthcare workers, and as expected, majority of the participants were married.

It was observed from this study that despite the fact that these health institutions were sited in urban areas, some of the workers stayed in the rural communities close to the institution, though there was no correlation between the place of residence and willingness to receive the vaccine. Afzal *et al.* (23) and Alrubaiee *et al.* (24), in their studies, found a correlation between the residence of the participants and willingness to receive the vaccine.

Assessment of the practice of the preventive measures showed that less than 50% of the healthcare workers practiced the preventive measures always and some only when present in a crowded environment. This finding among healthcare workers, who were in the middle of the fight against COVID-19 daily, was discouraging. When the participants who practiced these measures always, were combined with those that practiced them only when in crowded environment, it gives a substantial percentage (81.6%) of the participants that practiced the preventive measures, which was similar to findings reported by Zhong *et al.* (25) and Chirico *et al.* (26). The importance of vaccine uptake to achieve infectious disease control, cannot be overemphasized as vaccine hesitancy mitigates against this control (27). Most of the healthcare workers were aware of the COVID-19 and vaccine. This finding was particularly encouraging because of the pivotal role they play in patient care and information dissemination to the larger society. Despite this

awareness, about 5.8% of the healthcare workers were unwilling to receive the vaccination based on perceived misinformation from social media (28, 29). This is worrisome because they are likely to exert negative influence on local society and mitigate the gains achieved in the disease control. Information about COVID-19 and vaccine were sourced significantly from the social media, which have often misinformed the people about the realities of the pandemic. This also emphasizes the place of social media and information management in curtailing the COVID-19 pandemic.

In this study, a high proportion of participants were willing to take the vaccine when available, which was similar to findings by Fu *et al.* (30) and Gagneux-Brunon *et al.* (31). This study found that certain factors were associated with the willingness to accept COVID-19 vaccine and these factors include the gender, age, marital status, level of education and perception of the vaccine. Females were more willing to take the vaccine when compared to their male counterpart, as were also found in some earlier studies (31, 32). Participants with good perception of the vaccine were also willing to take the vaccine. Healthcare agencies need to promote appropriate information dissemination on COVID-19 vaccine to gain the trust of healthcare workers to accept the vaccine.

CONCLUSION

This study showed that healthcare workers had a high level of knowledge, possessed a positive attitude, and fair practice behavior of the preventive measures towards COVID-19. High level of willingness to take the vaccine was seen among the healthcare workers. Most of the information about the disease and vaccine were

sourced from the social media. The healthcare organizations and government agencies should gear efforts toward interventions to promote and increase awareness on the benefits of the preventive measures and vaccines through the social media platforms.

Conflict of interests:

There was none.

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Limitation of the study

This study was conducted among healthcare workers in secondary and tertiary healthcare facilities in Ilorin, which does not represent the total work force in the state.

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REFERENCES

1. Wu F, Zhao S, Yu B, Chen YM, Wang W, Song ZG *et al.* (2020). A new coronavirus associated with human respiratory disease in China. *Nature.*; 579:265–269.
2. Lu H, Stratton CW, Tang YW (2020). Outbreak of pneumonia of unknown etiology in Wuhan, China: the mystery and the miracle. *J Med Virol.*; 92:401–402.
3. Guo YR, Cao QD, Hong ZS, Tan YY, Chen SD, Jin HJ *et al.* (2020). The origin, transmission and clinical therapies on coronavirus disease 2019 outbreak-an update on the status. *Mil Med Res.*; 7:11.

4. World Health Organization (2021). WHO Coronavirus disease (COVID-19) Dashboard. {cited 27 Apr 2021}. Available: <https://covid19.who.int/table>
5. World Health Organization (2022). Coronavirus disease 2019 (COVID-19): situation report, 72. 2022. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/72>
6. Center for Disease Control and Prevention (CDC). COVID 19 What you should know. Available at <https://www.cdc.gov/coronavirus/2019-ncov/about/symptoms.html>
7. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y (2020). Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet.*; 395:497-506.
8. Azlan AA, Hamzah MR, Sern TJ, Ayub SH, Mohamad E (2020). Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia. *PLOS ONE.*; 15(8):45
9. Adela N, Nkengazong L, Ambe LA, Ebogo JT, Mba, FM, Goni HO *et al.* (2020). Knowledge, attitudes, practices towards COVID 19 preventive measures and symptoms: A cross-sectional study during the exponential rise of the out-break in Cameroon. *PLoS Negl. Trop Dis.*; 14:87
10. Saqlain M, Munir MM, Rehman SU, Gulzar A, Naz S, Ahmed Z *et al.* (2020) Knowledge, attitude, practice and perceived barriers among healthcare workers regarding COVID19: a cross-sectional survey from Pakistan. *J Hospital Infect.*; 105(3):19–423
11. Afolabi A, Ilesanmi O. (2021). Dealing with vaccine hesitancy in Africa: the prospective COVID-19 vaccine context. *Pan African Medical Journal.*; 38(3):84
12. Kumar D, Chandra R, Mathur M, Samdariya S, Kapoor N. (2016). Vaccine hesitancy: understanding better to address better. *Israel J Health Policy Res.*; 5(1): 2
13. Azlan AA, Hamzah MR, Sern TJ, Ayub SH, Mohamad E. (2020). Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia. *PLoS ONE.*; 15(5):23.
14. Taghrir MH, Borazjani R, Shiraly R. (2020). COVID-19 and Iranian Medical Students; A Survey on their Related Knowledge, Preventive Behaviors and Risk Perception. *Arch Iran Med.*; 23(4):249-254.
15. Voysey M, Clemens SAC, Madhi SA, Weckx LY, Folegatti PM, Aley PK. (2021). Safety and efficacy of the ChAdOx1 nCoV-19 vaccine (AZD1222) against SARS-CoV-2: an interim analysis of four randomised controlled trials in Brazil, South Africa, and the UK. *Lancet.*; 397:99–111.
16. Sallam M, Dababseh D, Yaseen A, Al-Haidar A, Nidaa A. (2020). Conspiracy Beliefs Are Associated with Lower Knowledge and Higher Anxiety Levels Regarding COVID-19 among Students at the University of Jordan. *Int J Environ Res Public Health.* ; 17(14): 4915.
17. Lin Y, Hu Z, Zhao Q, Alias H, Danaee M. (2020). Understanding COVID-19 vaccine demand and hesitancy: A nationwide online survey in China. *PLoS Negl Trop Dis.*; 14:52
18. Wong MCS, Wong ELY, Huang J, Cheung AWL, Law K, Chong MKC. (2021). Acceptance of the COVID-19 vaccine based on the health belief model: a population-based survey in Hong Kong. *Vaccine.*; 39(7):1148–56.
19. Harrison EA, Wu JW. (2020). Vaccine confidence in the time of COVID-19. *Eur J Epidemiol.* ; 35(4):325–30
20. Dubé E. (2017). Addressing vaccine hesitancy: the crucial role of healthcare providers. *Clin Microbiol Infect.*; 23(5):279–280
21. Zhang M, Zhou M, Tang F, Wang Y, Zhang L, You G. (2020). Knowledge, attitude, and practice regarding COVID-19 among

- healthcare workers in Henan, China. *J Hospital Infect.*; 105(2):183– 187.
22. Bohme S, Varghese E, Sabat I, Barros P, Brouwer W, Van Exel J. (2020). Once we have it, will we use it? A European survey on willingness to be vaccinated against COVID-19. *Eur J Health Econ.*; 21(7):977-82.
23. Afzal MS, Khan A, Qureshi UUR, Saleem S, Saqib MAN, Shabbir RMK *et al.* (2020). Community-based assessment of knowledge, attitude, practices and risk factors regarding COVID-19 among Pakistani residents during a recent outbreak: a cross-sectional survey. *J Community Health.*; 1(11):21.
24. Alrubaiee GG, Al-Qalah TAH, Al-Aawar MSA. (2020). Knowledge, attitudes, anxiety, and preventive behaviours towards COVID-19 among health care providers in Yemen: an online cross-sectional survey. *BMC Public Health.*; 20(1):1541
25. Zhong BL, Luo W, Li HM. (2020). Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross sectional survey. *Int J Biol Sci.*; 16(10):1745–1752
26. Chirico F, Nucera G, Magnavita N. (2020). COVID-19: protecting healthcare workers is a priority. *Infect Control Hosp Epidemiol.* ; 1:202-18
27. Enitan SS, Oyekale AO, Akele RY, Olawuyi KA, Olabisi EO. (2020). Assessment of Knowledge, Perception and Readiness of Nigerians to Participate in the COVID-19 Vaccine Trial. *Int J Vaccine Immunizat*; 4(1):2470-99
28. Garrett L. (2020). COVID-19: the medium is the message. *Lancet.* ; 395(6):1–3
29. Lee JJ, Kang KA, Wang MP, Zhao SZ, Wong JYH, O'Connor S *et al.* (2020). Associations between COVID-19 misinformation exposure and belief with COVID-19 knowledge and preventive behaviors: cross-sectional online study. *J Med Internet Res.*; 22(11):28
30. Fu C, Wei Z, Pei S, Li S, Sun X, Liu P. (2020). Acceptance and preference for COVID-19 vaccination in health-care workers (HCWs). *medRxiv.*; 2962(548):49
31. Gagneux-Brunon A, Detoc M, Bruel S. (2021). Intention to get vaccinations against COVID-19 in French healthcare workers during the first pandemic wave: a cross-sectional survey. *Journal of Hospital Infection.*; 108:168–173
32. Nzaji MK, Ngombe LK, Mwamba GN. (2020). Acceptability of vaccination against COVID-19 among healthcare workers in the Democratic Republic of the Congo. *Pragmatic and Observational Research.*; 11:103–109.