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STUDY ON THE WILLINGNESS TO ACCEPT COVID-19 VACCINE AMONG HEALTHCARE WORKERS IN GOMBE, NORTH-EAST, NIGERIA

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ABSTRACT

Background: The accelerated pace of COVID-19 vaccine development has heightened public anxieties and could compromise acceptance. The aim of this study was to assess the level of willingness to accept COVID-19 vaccine among healthcare workers in Gombe and the objectives was to assess the knowledge toward COVID-19 and the level of willingness of healthcare workers in Gombe to accept COVID-19 vaccine, and to determine factors that influence vaccination willingness. **Materials and Methods**: This was a cross-sectional study conducted among 234 healthcare workers. The data were collected using self-administered questionnaire and were analysed using SPSS version 23 at univariate, bivariate and multivariate levels. A P-value of <0.05 was considered to be statistically significant. **Results:** Mean age of respondents was 35.6±7years. Those who are aged 31 - 45years constitute about three-fifth (60.6%) of the study population. Of the total studied participates, 128(60.1%) were male and 150(70.4%) were married. About two-fifth of the participants were nurses. 54.9% of the participants worked in tertiary health facility while more than half (52.6) had worked for than 10 years. Majority (99.1%) of the participants had good knowledge of COVID-19while two-third (65.7%) of the healthcare workers are willing to accept COVID-19 vaccine. Professional cadre, years of experience and the type of health facilities remain significant predicators of willingness to accept COVID-19 vaccine among the healthcare workers (P< 0.05). **Conclusion:** In this study, profession cadre**,** years of experience and the type of healthcare facility influence vaccination willingness among healthcare workers in Gombe.

1.0: INTRODUCTION

Coronavirus disease 2019 (abbreviated "COVID-19") is an emerging respiratory disease that is caused by a novel coronavirus. The virus that causes COVID -19 was initially called as 2019-nCoV and was then termed as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) by the International Committee on Taxonomy of Viruses (ICTV) (Cascella et al., 2020). It is a new strain discovered in 2019 which was not found previously in humans. SARS-CoV-2 seems to have originated from bats and first reports of cases were from Wuhan, Hubei Province in China, suggesting an animal-to-person spread from a live animal market. The virus then spread outside Hubei and subsequently, to the rest of the world via human transmission. Several countries have now reported community spread. The World Health Organization declared coronavirus disease as a pandemic on March 11, 2020 (WHO 2020).

The disease is highly infectious, and its main clinical symptoms include fever, dry cough, fatigue, myalgia, and dyspnea. The WHO reported that more than 80% of COVID-19 patients showed mild symptoms and recovered without any medical intervention, approximately 20% of infected cases had a severe illness such as shortness of breath, septic shock and multi-organ failure, and it has been reported that an estimated 2% of cases can be fatal (WHO 2020). The risk of increased severity was noticed in the elderly and those with underlying chronic diseases.

With its mode of transmission, healthcare workers are among the highest risk of being infected. The highly contagious SARS-CoV-2 virus is an additional hazard for the healthcare system apart from the burden of extended work hours, physical and psychological stress, burnout, and fatigue (Langade et al., 2016).In addition to healthcare workers (HCWs) being at a high risk of getting the infection, they can also be a source of transmission in the community.

Knowing that social distancing and quarantine may slow the spread of the virus and flatten the epidemic curve; it may not be sufficient to completely halt the spread of COVID-19, herd immunity gained by infection or vaccination will need to be well established within the

population (Fu et al., 2020). The most effective way of controlling infectious diseases is often vaccination, while success is challenged by individuals and groups who choose to delay or refuse vaccines (Paterson et al., 2016).

In 2015, the World Health Organization (WHO) Strategic Advisory Group of Experts on Immunization defined vaccine hesitancy as a 'delay in acceptance or refusal of vaccination despite availability of vaccination services' (MacDonald et al.2015), which can vary in form and intensity based on when and where it occurs and what vaccine is involved, as has been confirmed in study (Karafillakis et al., 2017). Concern about vaccine hesitancy is growing worldwide (European Parliament 2017); in fact, WHO identified it as one of the top ten global health threats in 2019 (https://www.who.int/news-room/spotlight/ ten-threats-to-global-health-in-2019). In many countries, vaccine hesitancy and misinformation present substantialobstacles to achieving coverage and community immunity (Lane et al., 2018).

Governments, public health officials and advocacy groups must be prepared to address hesitancy and build vaccine literacy so that the public will accept immunization when appropriate. Anti-vaccination activists are already campaigning in multiple countries against the need for a vaccine, with some denying the existence of COVID-19 altogether (Enserink et al., 2020). Misinformation spread through multiple channels could have a considerable effect on the acceptance of a COVID-19 vaccine (Cornwall et al., 2020). The accelerated pace of vaccine development has further heightened public anxieties and could compromise acceptance (Fadda et al., 2020).

Governments and societies must gauge current levels of willingness to receive a potentially safe and effective COVID-19 vaccine and identify correlates of vaccine hesitancy and/or acceptance.

The objective of this study was to assess the knowledge toward COVID-19 and to access the level of willingness of healthcare workers in Gombe to accept COVID-19 vaccine, and to determine associated factors of vaccination willingness. The findings will help authorities organize the necessary educational programs in order to provide up-to-date information and deliver the best practice to control the COVID-19 disease and to raise vaccine confidence among the healthcare workers and the population in general.

MATERIALS AND METHOD

Study design

A descriptive cross sectional study was carried out among randomly selected healthcare workers across various health facilities in Gombe State located in the North-eastern part of Nigeria in the first to second week of March 2021 and the information were collected through the use of structured on-line questionnaire to assess respondents on the study objectives.

Study Area

The study was conducted in some randomly selected healthcare facilities across currently existing 579 healthcare facilities in Gombe State, Northeastern Nigeria.

Study Population

Study populations were doctors, nurses, laboratory scientists and pharmacists practicing in Gombe at the time of the survey who were willing to participate in the survey.

Sample size determination

The calculated sample size with 10% non-response rate was 234 using the Cochran's formula.

Sampling method

A systematicsampling technique was used where every 5^{th} of the study group out of 1130 were selected to participate in the survey.

Data collection

The questionnaire which was self-administered was adapted from a study and was administered through on-line Google form after obtaining consent from the participants. It consists of a section on socio-demographic characteristics and another section on knowledge of COVID-19 and willingness to accept COVID-19 vaccine. The questions on knowledge of COVID-19of the respondents were allotted a score of one for every correct answer and zero for wrong or unanswered questions, and the knowledge thereafter graded into poor knowledge with a total score of less than 6 and good knowledge with a total score of equal to or greater than 6.The questions on willingness to accept COVID-19 vaccinewere measured on Likertscale from 1 to 5, with completely disagreed equal to 1 and completely agreed equal to 5. The willingness to accept the vaccine was then graded into willingness to accept with a total score greater 6 and willingness not to accept with a total score equal to or less than 6.

Data analysis

The data were coded, checked, and processed with version 23 Statistical Package for the Social Sciences. Descriptive statistics, such as means, standard deviations (SD), frequencies, and proportions, were used to summarize variables. Chi-square tests were used to identify associations between categorical variables using a P-value of 0.05 at 95% confidence interval as the significance level. Logistics regression was used to determine the predicators of willingness of the healthcare workers to accept COVID-19 vaccine.

Ethical consideration

Institutional approval for the conduct of the study was obtained from Gombe state ministry of health. The study was conducted according to the Principles of the Helsinki Declaration. Before the questionnaire was applied to the respondents, permission was obtained

from the healthcare facility authority and consent was obtained from all the respondents who participated in the study. The respondents were specifically informed regarding their entitlement to information regarding the study, voluntary participation, privacy issues, their right to refuse to divulge information, and to terminate their participation at any time.

RESULTS

Table 1: Distribution of socio-demographic characteristics of the respondents.

Characteristics	Frequency (%) n=213
Age in years	
18-30	52(24.4)
31-45	129(60.6)
>45	32(15.0)
Mean age of respondents	35.6±7.0
Gender	
Male	128(60.1)
Female	85(39.9)
Religion	
Islam	142(66.7)
Christianity	71(33.3)
Marital status	
Single	62(29.1)
Married	150(70.4)
Divorced	1(0.5)
Senatorial district	
Gombe Central	119(55.9)
Gombe North	65(30.5)
Gombe South	29(13.6)
Profession	
Doctor	67(31.5)
Nurse	84(39.4)
Laboratory Scientist	52(24.4)
Pharmacist	10(4.7)
Duration of working experience in years	
10 and below	101(47.4)
Above 10	112(52.6)
Type of health facility	
Tertiary	117(54.9)
Secondary	65(30.5)
Primary	12(5.6)
Private	19(8.9)

Table 2: Summary of respondents' knowledge grade on COVID-19.

Knowledge	Frequency Percentage (%) n=213
Good knowledge	211(99.1)
Poor knowledge	2(0.9)

Table 3: Chi square analysis of association between Knowledge grade of COVID-19and socio-demographic characteristics.

Variable	Good knowledge	Poor knowledge	X^2	p-value
Age in years				
18-30	51(98.1)	1(1.9)		0.643[†]
31-45	128(99.2)	1(0.8)		
45 and above	32(100.0)	0(0.0)		
Gender				
Male	128(100.0)	0(0.0)		0.081[†]
Female	83(97.6)	2(2.4)		

Religion				
Islam	140(98.6)	2(1.4)		0.553[ŧ]
Christianity	71(100.0)	0(0.0)		
Marital status				
Single	62(100.0)	0(0.0)		0.654[ŧ]
Married	148(98.7)	2(1.3)		
Divorced	1(100.0)	0(0.0)		
Senatorial district				
Gombe Central	118(99.2)	1(0.8)		0.764[ŧ]
Gombe North	64(98.5)	1(1.5)		
Gombe South	29(100.0)	0(0.0)		
Professional cadre				
Doctor	67(100.0)	0(0.0)		0.373[ŧ]
Nurse	82(97.6)	2(2.4)		
Laboratory Scientist	52(100.0)	0(0.0)		
Pharmacist	10(100.0)	0(0.0)		
Years of working experience				
10 years and below	100(99.0)	1(1.0)		0.941[ŧ]
Above 10 years	111(99.1)	1(0.9)		
Type of facility				
Tertiary	117((100.0)	0(0.0)		0.035[ŧ]
Secondary	64(98.5)	1(1.5)		
Primary	11(91.7)	1(8.3)		
Private	19(100.0)	0(0.0)		

[ŧ] Fisher's exact test

Table 4: COVID-19 vaccine acceptance grade.

Response	Frequency (%) n=213
Acceptance	140(65.7)
Non acceptance	73(34.3)

Table 5: Chi square analysis of association between acceptance of COVID-19 vaccine and socio-demographic characteristics.

Variable	Accept N=140(%)	Not accept N=73(%)	X^2	p-value
Age in years				
18-30	32(61.5)	20(38.5)	1.589	0.452
31-45	89(69.0)	40(31.0)		
45 and above	19(59.4)	13(40.6)		
Gender				
Male	94(73.4)	34(26.6)	8.464	0.004*
Female	46(54.1)	39(45.9)		
Religion				
Islam	86(60.6)	56(39.4)	5.044	0.025*
Christianity	54(76.1)	17(23.9)		
Marital status				
Single	47(75.8)	15(24.2)		0.100 [ŧ]
Married	92(61.3)	58(38.7)		
Divorced	1(100.0)	0(0.0)		
Senatorial district				
Gombe Central	80(67.2)	39(32.8)	0.327	0.849
Gombe North	42(64.6)	23(35.4)		
Gombe South	18(63.1)	11(37.9)		
Professional cadre				
Doctor	53(79.1)	14(20.9)		0.000 [ŧ]
Nurse	41(48.8)	43(51.2)		
Laboratory Scientist	42(80.8)	10(19.2)		

Pharmacist	4(40.0)	6(60.0)		
Years of working experience				
10 years and below	58(57.4)	43(42.6)	5.877	0.015*
Above 10 years	82(73.2)	30(26.8)		
Type of facility				
Tertiary	85(72.6)	32(27.4)		0.000 †
Secondary	27(41.5)	38(58.5)		
Primary	10(83.30	2(16.7)		
Private	18(94.7)	1(5.3)		

*Statistically significant. † Fisher's exact test

Table 6: Logistics regression analysis factors associated with vaccine acceptance.

Variable	Crude OR	AOR (95% CI)	p-value
Gender			
Male	1		
Female	0.575	1.777(0.858-3.677)	0.121
Religion			
Islam	1		
Christianity	-0.404	0.668(0.307-1.450)	0.307
Professional cadre			
Doctor	1		0.007
Nurse	-2.446	0.087(0.016-0.465)	0.004
Lab Scientist	-1.830	0.160(0.030-0.852)	0.032
Pharmacist	-2.795	0.061(0.010-0.363)	0.002
Years of working experience			
10 years and below	1		
Above 10 years	0.606	1.833(0.922-3.647)	0.084
Type of health facility			
Tertiary	1		0.001
Secondary	1.462	4.315(0.440-42.331)	0.209
Primary	2.614	13.653(1.423-131.092)	0.023
Private	-0.743	0.476(0.020-11.403)	0.647
Knowledge grade			
Good knowledge	1		
Poor knowledge	-22.463	0.000(0.000)	0.999

DISCUSSION

The willingness of healthcare workers in Gombe to accept a COVID-19 vaccine was assessed using Google form online questionnaire in which about 234 responses were received, out of which 213 participants consented to participate giving a response rate of 91.0% and this is in agreement with a similar study in Nigeria but among general population (Paschal et al., 2021l). About two-fifth of the respondents (60.1%) were male which was not in agreement with the study in Nigeria (Paschal et al., 2021l). Majority of the respondents had a good knowledge of COVID-19 in this study.

About two-third of the healthcare workers in this were willing to accept COVID-19 vaccine. This is higher than the result of a similar study among healthcare workers in Congo (Kabamba et al., 2021). The result of this study was not surprise looking at the higher proportion of health workers with good knowledge of COVID-19. The result of this study is similar to a global survey (Jeffrey et al., 2021) and a study in France(Detoc et al., 2020) about the willingness of the participants to get vaccinated. This corresponds with the findings ofa study showing significant signs of positive responses towards accepting a COVID-19 vaccine in Australia (Dodd et al., 2020), and the findings of a study where over two-third of the participants were willing to take a COVID-19 vaccine when one becomes available in Canada provided it's safe for use (Frank et al., 2020). It also corresponds with the results found in Europe with 73.9% of the participants willing to take a potential COVID-19 vaccine (Neumann-Böhme et al., 2020)

Doctors are more willing to accept COVID-19 vaccine compared to other healthcare workers in this study. This is not surprise has study in Italy showed that more doctors died of COVID-19 than other healthcare workers (Felice et al., 2020).

The less experienced healthcare workers have expressed more willingness to accept COVID-19 vaccine compared to more experienced ones in this study. This may be due to an increased risk perception of disease in the less experienced ones compared to more experienced ones.

In this study, the healthcare workers in tertiary health facility are more willing to accept the vaccine compare to other healthcare workers in other health facilities and this is not surprise since the healthcare workers in tertiary health facility are more exposed to COVID-19 because COVID-19 patients are managed in tertiary healthcare centres.

Professional cadre, years of experience and the type of health facilities remain significant predicators of willingness to accept COVID-19 vaccine among the healthcare workers

CONCLUSIONS

Higher proportion of healthcare workersin this study have expressed willingness to accept COVID-19 vaccine but compared the proportion of the healthcare workers with good knowledge of the disease, it shows that vaccine hesitancy could be a barrier to implementing vaccination campaignsamong healthcare workers in Gombe. Profession cadre**,** years of experience and the type of healthcare facility influence vaccination willingness among healthcare workers in Gombe.

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