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Perception, precausions and acceptance of vaccination against SARS COV-2 viral infection among health workers in two tertiary hospitals in southeast Nigeria, four years after the onset of the pandemic

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***Abstract*---**Background: The study was conducted in two tertiary hospitals located in ababkaliki the capital city of Ebonyi State. Aim: To ascertain the perception, awareness and vaccination of COVID-19 among the health workers. Methods: A questionnaire/data sheet was developed for the study. Information on sociodemographic characteristics, perception and awareness and COVID 19 vaccination were obtained. The data were fed into the computer using SPSS version 25, Illinoi USA and analysis done. Results: We had 420 respondents with the mean age of 39.1±9.8 and ranged from 20 to 70years made up of doctors, nurses/midwives, laboratory scientists, pharmacists and others. There was high awareness of COVID 19 in the group but with poor knowledge of spread 47.4% and preventive measures 43.1%. awareness of vaccine was high 96.9% but the uptake was low 33.8% with major reason being fear of side effect and some also believe vaccine is a scam. Some of the respondents were survivors of COVID 19. Conclusion: There is high awareness of COVID

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19 disease in the hospitals but poor knowledge of mode of spread and preventive measures including very low uptake of anti-COVID 19 vaccines and inadequate provision of PPEs 4 years after the onset of the pandemic.

***Keywords*---**COVID-19 infection, awareness, vaccination.

Introduction

The outbreak of the pneumonia caused by coronavirus started in Wuham, China on December 8 2019 but the first report to the World Health Organization (WHO) was on 31st December 2019 (WHO 2020). The causative organism was later identified as "Severe Acute Respiratory Syndrome Coronavirus 2 (SARS Cov-2) and was called Coronavirus disease 2019 (COVID-19). The acronym COVID-19 was used to avoid stigmatization of the virus origin in terms of population, geography and animal origin (WHO 2020) From there (Wuham, China) the disease started spreading to other countries of the world. On January 30th 2020, the WHO declared the disease a public health emergency of international concern and described measures and actions and charged all countries to take necessary measures urgently to slow down the disease transmission (WHO 2020). The disease was declared a pandemic on March 1st 2020 and by June 7th the same year there were already 7 million cases globally (WHO 2020). As at 26th of April 2023, the WHO reported 764,474,387 confirmed cases with 6,915,286 deaths (WHO 2023).

The first case in Nigeria was reported by Nigerian Center for Disease Control (NCDC) on the 27th of February 2020 on an Italian traveler. The disease spread across the country and is mostly imported, affected people aged 31 – 50 years and males were more affected than female (Okoroiwu h u et al 2020). The available data on the country by NCDC as at April 27th 2023 are as follows.: confirmed cases 266,665, active cases 3,559, discharged cases 259,951 and number of deaths 3,155 (NCDC 2023).

The first case in Ebonyi State was announced by the State Governor on April 26th 2020. The disease was noted to have spread fast in the state after the index case and was mostly brought by returnees. This was as a result of undermining the interstate restriction of movement at the borders by security personnel collecting bribe and allowing free movement at night while others took alternative routes to enter the state (Azuogu B N et al 2021). As at 27th April, 2023 the state had recorded 2,064 confirmed cases, 28 cases on admission, 2,004 discharged and 32 deaths (NCDC 2023).

There is no widely acceptable cure for the disease hence precautionary measures were relied upon to prevent the spread. Measures such as hygienic practices like frequent hand wash with soap and water, use of hand sanitizers, social distancing were introduced and wearing of personal protective equipment (PPE) by the frontline health workers. Quarantine of infected or suspected cases were also done. In the country Nigeria, the existing facilities and equipment including ventilators and PPE were grossly inadequate to handle the medical emergency due

to COVID-19. The existence of these challenges among the health care workers during the pandemic was high and affected their coping strategies and resilience (Anita Mfuh Y. et al 2021) Adherence to Infection Prevention and Control (IPC) measures among health care workers were influenced by institutional and personal factors hence government and health administrators should play a role of ensuring availability and adherence to IPC resources and measures in order to curb the spread (Mohammed A. et al 2021). There was also associated psychological distress among frontline health care workers which may require the development and implementation of interventions to reduce the impact on long term mental wellbeing in those treating COVID 19 patients (Okechukwu B. A. et al 2020).

Due to the high contagious nature of the disease more drastic measures were introduced to curb the spread. There was total and partial lockdown in many countries and states, boarder closure, travel as well as social gathering ban. The public health impact include disruption in medical supply chain, blood transfusion services, diagnosis and management of chronic diseases, people's livelihood, health and food systems (Ogbuinya N E O et al 2022, Okafor U G et al 2021, Ogar C O et al 2021, Okoroiwu H U et al 2021 and Pley C M et al 2021).

Vaccine was however rapidly developed during the pandemic. Nigeria received a total of 3.94million doses of vaccine in March 2021. Vaccination however faced the challenges of non-acceptance hence coverage remained low in the country. There was general hesitancy to and negative perception on vaccine uptake with some 'NO VACCINE' advocates believing that it is unwholesome and tool of the government to have control over the masses as well as perceived side effects (WHO 2021, WHO 2021, Enitan S S et al 2020 and Eniade o d et al 2021). Global vaccination reported by WHO as at 24th April 2023 was 13,325,228,015 and total vaccination for Nigeria was 116,606863 as at 19th March 2023 (WHO 2023). Ebonyi State government received a delivery of 46,088 of Moderna and 10,616 doses of AstraZeneca COVID 19 vaccines. On the 21st of December 2021 the state governor kicked off the mass immunization campaign in Ebonyi state and set a target of 1,500,000 people to get immunized. The two tertiary hospitals where this study was carried out (Alex Ekwueme Federal University Teaching Hospital AEFUTHA and National Obstetric Fistula center NOFIC) both served as immunization centers against the pandemic.

Most of the stringent measures against the transmission of this disease have been relaxed by most government irrespective of the fact that there is still sporadic diagnosis of this disease in many countries including Nigeria. This study is therefore set out to ascertain the perception, observance of safety precautions/use of PPE, availability, acceptability of vaccines and vaccination among the health workers in these two tertiary hospitals, 4 years after the onset of the pandemic in Southeast Nigeria.

Materials and Method

This is a cross-sectional prospective study conducted in two tertiary hospitals AEFUTHA and NOFIC in Abakaliki the capital city of Ebonyi state in July 2023. The purpose and methods of the study were explained to the participants in

details and informed consent obtained prior to recruiting them into the study. The exclusion criteria were those that refuse consent. The study population comprised of consecutive and convenient recruitment of participants. The questionnaire designed for the study was administered to them. Socio-demographic information including the age, occupation, educational status, religion were obtained. The details of perception, precautionary practices and COVID 19 vaccination were recorded.

The research and ethics committee of Alex Ekwueme Federal University Teaching Hospital approved the study protocol. Informed consent was obtained from the participants and given the option to opt out at any time if they do not wish to continue. Those who do not practice precautionary measures were counseled adequately on the importance for containing and avoiding further spread of the virus and other infections prevalent in the state like Lassa Fever. A similar study reported 51% compliance among health workers. The sample size was calculated using the following formula:

$$n = z^2 P(1 - P)/d^2$$

Where:
n = The required minimum sample size,
z = A number relating to the degree of confidence = 1.96,
P = The proportion of awareness from a similar study = 82%,
d = The tolerable error for the study = 5%.

Thus, the estimated minimum sample size was 384. But considering attrition rate of 10% the sample size was increased to 427 participants. The information obtained was recorded in the data collation sheet designed for the study. The coded data were fed into the computer using the SPSS version 25 program, Illinois USA and analysis done. A *P* value less than 0.05 was considered significant.

Results

A total of 420 respondents who consented were recruited into the study. The participants were made up of 161 (38.3%) medical doctors, 140 (33.3) nurses/midwives, 24 (5.7%) ward orderlies, 22 (5.2%) medical laboratory scientists, 18 (4.3%) pharmacists and 55 (13.1%) others (porters, administrative staff, security etc.). The mean age of the respondents was 39.1 (9.8) and ranged between 20 to 70 years. The highest age group in the study was 40 – 49years (33.3%) followed by those aged between 20 – 29 years (23.3%). Most of the respondents (97.1%) were Christians while 91.2% had tertiary education. Awareness of COVID 19 viral disease was very high (99.5%) in the group and 76% of the respondents believe the disease still exists while 24% believe the disease no longer exists, however 2 (0.5%) respondents were not aware of the existence of the pandemic. Table 1.

Table 1
Socio-demographic characteristics of and COVID 19 awareness among respondents

Socio-demographic Variables	No of Respondents (n=420)	Percentage (%)
Age Group		
20-29	98	23.3
30-39	130	31
40-49	140	33.3
50-59	46	11
≥60	6	1.4
Mean ±SD (Range)	39.1±9.8 (21–70)	
Occupation		
Doctor	161	38.3
Nurse/midwife	140	33.3
Ward orderly	24	5.7
Medical laboratory	22	5.2
Pharmacist	18	4.3
Others	55	13.1
Religion		
Christian	408	97.1
Muslim	6	1.4
Traditional	6	1.4
Level of Education		
Below tertiary education	37	8.8
Tertiary education	383	91.2
COVID-19 Awareness		
Do you know of the disease called COVID-19		
No	2	0.5
Yes	418	99.5
Do you think it still exist		
No	101	24
Yes	319	76

There was poor knowledge (47.4%) of how the disease is spread among the respondents. Majority of the respondents (95.2%) knew that the disease can be prevented but there was still poor knowledge of the preventive measures (43.1%) Table 2.

Table 2
Knowledge of spread and prevention of COVID-19

Spread of COVID-19	No of Respondents (n=420)	Percentage (%)
How does it spread? **		
By air droplets	341	81.2
Close contact with infected person	348	82.9

Contact with corpse of a person killed by the disease	301	71.1
Contact with body fluid of infected person	311	74.0
Hand shake with the infected person	258	61.4
knowledge of spread of COVID-19		
Poor	221	52.6
Good	199	47.4
Can COVID 19 be prevented		
No	20	4.8
Yes	400	95.2
How can it be prevented **		
Frequent hand was with soap and water and or use of hand sanitizer	391	93.1
Social distancing	368	87.6
No body contact including hand shake	292	69.5
Stoppage of social gathering	288	68.6
Use of face masks/PPE	367	87.4
Safe burial methods	316	75.2
Quarantine of diagnosed/suspected cases	341	81.2
Border closures/travel ban	254	60.5
Partial or total lockdown	247	58.8
Vaccination	345	82.1
knowledge of prevention of COVID-19		
Poor	239	56.9
Good	181	43.1

**Multiple responses allowed

The preventive measures mainly practiced now is frequent hand wash with soap and water/hand sanitizers (91.9%) and use of face mask (76.7%). About 75.2% of the respondents mentioned border closure, market and church or social gathering ban etc no longer practiced (because the government had lifted the ban) as the current preventive measures. About 8.1% of the respondents no longer practice any method. The present practice of preventive measures in the facilities were very poor 16 (3.8%) and 59.5% of the respondents reported in adequate provision of personal protective equipments. Majority of the respondents (96.9%) were aware of the availability of vaccine but only 33.8% were vaccinated. The major reason for not getting vaccinated was fear of side effect (34,5%), some (24.3%) does not want the vaccine while 6.4% believe vaccine is a scam by government. Only 6.2% of the respondents completed the required number of doses. Seventy-nine (18.8%) of the respondents were involved in caring for COVID 19 disease patients while 32 (7.6) were infected with the disease themselves. Table 3.

Table 3
Preventive measures still practiced/involvement in COVID patient management

Preventive Measures of COVID-19 in Practice	No of Respondents (n=420)	Percentage (%)
Which of the preventive measures is still practiced in your facility **		
Frequent hand was with soap and water and or use of hand sanitizer	386	91.9
No body contact including hand shake	58	13.8
Use of face masks/PPE	322	76.7
Quarantine of diagnosed/suspected cases	167	39.8
Vaccination	215	51.2
Others (methods already stopped by	316	75.2
Government)	34	8.1
None		
Preventive measures still practiced		
Poor	404	96.2
Good	16	3.8
Vaccination		
Are you aware of COVID-19 vaccine?		
No	13	3.1
Yes	407	96.9
Have you been vaccinated		
No	278	66.2
Yes	142	33.8
How many doses did you receive?		
None	287	68.3
Once	39	9.3
Twice	68	16.2
Thrice	26	6.2
Reasons given **		
Vaccine not available	24	5.7
Vaccine not available	26	6.2
Fear of side effects	145	34.5
Does not want vaccine	102	24.3
Vaccine is a scam by government	27	6.4
Completed the number of doses	26	6.2
Were you involved in caring for COVID-19 patients?		
Yes	79	18.8
No	341	81.2
Did your facility provide all the required PPE?		
Yes	170	40.5
No	250	59.5
Were you infected with COVID-19?		
Yes	32	7.6
No	388	92.4

**Multiple responses allowed

There is weak correlation between knowledge of spread with age (x^2 = 9.477, *Pv* = 0.046) and Occupation (x^2 = 11.146, *Pv* = 0.049) but strong and significant correlation with level of educational (x^2 = 18.667, *Pv* = 0.000). Knowledge of prevention was not significantly related to age (x^2 = 9.262, *Pv* = 0.051) and Occupation (x^2 = 10.810, *Pv* = 0.055) but significantly related to educational level (x^2 = 11.954, *Pv* = 0.001). the respondents that cared for COVID 19 disease patients were more infected with the disease than others (x^2= 7.924, Pv = 0.005). Table 4.

Table 4
Relationship between socio-demographic variables and knowledge of spread/prevention of COVID-19 and infection with COVID 19

Socio-demographic Variables	Knowledge of the Spread		x2	P-value
	Poor	Good		
Age group				
21-30	51(52.0)	47(48.0)	9.477*	0.046
31-40	73(56.2)	57(43.8)		
41-50	73(52.1)	67(47.9)		
51-60	18(39.1)	28(60.9)		
>60	6(100.0)	0 (0.0)		
Occupation				
Doctors	73(45.3)	88(54.7)	11.146	0.049
Nurses/midwifes	87(62.1)	53(37.9)		
Ward orderly	15(62.5)	9 (37.5)		
Med Lab scientist	9 (40.9)	13(59.1)		
Pharmacist	8 (44.4)	10(55.6)		
Others	29(52.7)	26(47.3)		
Level of education				
Below tertiary education	32 (86.5)	5 (13.5)	18.667	0.000
Tertiary education	189(49.3)	194(50.7)		
	Knowledge of Prevention			
Age (years)				
21-30	51(52.0)	47(48.0)	9.262*	0.051
31-40	69(53.1)	61(46.9)		
41-50	89(63.6)	51(36.4)		
51-60	24(52.2)	22(47.8)		
>60	6(100.0)	0 (0.0)		
Occupation				
Doctors	81(50.3)	80(49.7)	10.810	0.055
Nurses/midwifes	91(65.0)	49(35.0)		
Ward orderly	17(70.8)	7(29.2)		
Med Lab scientist	9 (40.9)	13(59.1)		
Pharmacist	10(55.6)	8 (44.4)		
Others	31(56.4)	24(43.6)		
Level of education				

Below tertiary education	31(83.8)	6 (16.2)	11.954	0.001
Tertiary education	208(54.3)	175(45.7)		
Involved in caring for COVID patients		Infected with COVID		
		Yes		
Number		No	7.924	0.005
Yes		12(15.2)		
No		67(84.8)		
		321(94.1)		
		20(5.9)		

* Fisher's exact test used

Discussion

There was almost hundred percent awareness (99.5%) of CVID 19 disease among the respondents. This may be as a result of the fact that the study was conducted in the hospital environment with high level of health education, advocacy, sensitization about the disease and its case fatality rate with a good number of clinicians and other health workers participating. Most of the respondents (76%) believe the disease still exists while 24% are of the opinion that the disease does not exist any longer. This may be due to the fact that most government had relaxed most of the strict measure like border closure and travel ban, Ban of social gathering, church and market closure. There is also marked reduction in screening/testing, contact tracing, diagnosis and quarantine of diagnosed or suspected cases. The government had also closed the isolation/treatment centers. The last confirmed case in the state was on 20th of September, 2022 while the last suspected case was on the 20th of April, 2023. (Information from The Virology Center, Alex Ekwueme Federal University teaching Hospital, Abakaliki, Ebonyi State). This may not mean that that the disease is no longer with us but shows that testing has drastically reduced as well as contact tracing. It is also possible that the variant may not be easily detected by the available kit. The development and use of vaccines may also have contributed to their opinion of none existent of the disease anymore.

Majority of the respondents knew that the disease can be transmitted from one person to the other but the knowledge of methods of spread is very poor. About 52.6% has poor knowledge of spread. This may be as a result of the method we used where anyone that does not know one or more out of the methods of spread is classified as poor knowledge. There was weak correlation between knowledge of spread with age and occupation but significant correlation with level of education. This may be due to the fact that those that had tertiary education may have more access and understanding of information about the disease.

Majority of the respondents (95.2%) knew that the disease can be prevented but there was however poor knowledge of preventive measures as 56.9% had poor knowledge using the method of all or none as explained above. Most of the preventive measures still practiced by some include; frequent hand wash with soap and water/hand sanitizers (91.9%), followed by face mask/PPE (76.7%) and thirdly vaccination (51.2%) but 8.1%% of the respondents do not use any

preventive measure any longer. This may be because they believe that the disease no longer exists. There was weak correlation between age and occupation with knowledge of prevention but significant correlation with the level of education. This may be because the same reason given above for knowledge of spread.

Majority of the respondents were aware of the existence of vaccine against the disease (96.9%) but vaccine uptake was low (33.8%). Among those that took the vaccine, some only took once and only 6.2% completed the number of doses required. The reasons for this poor uptake of COVID 19 vaccine were; fear of or development of/or side effects, some just does not want the vaccine while others claimed that vaccine is a scam by government. These challenges about the vaccines had been reported in previous studies (Enitan SS et al 2020, Eniade OD et al 2021 and Chidebe CA et al 2020). Most of the reported side effects were fever, pain at injection site, headache, muscle ache, fatigue, nausea, diarrhea and chills. The were people that cared for the COVID 19 disease patients were more likely to get infected and the correlation is significant. This may be as a result of increased exposure, lack of or incorrect use of or inappropriate personal protective equipment (PPE). There was inadequate provision of the correct and all the required PPEs reported in this study.

Conclusion

There is high awareness of COVID 19 disease in the hospitals but poor knowledge of mode of spread and preventive measures including very low uptake of anti-COVID 19 vaccines and inadequate provision of PPEs 4 years after the onset of the pandemic.

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Conflict of Interest

None declared.

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