

**HEPATITIS B VACCINATION COVERAGE AND DETERMINANTS AMONG HEALTHCARE WORKERS IN A TERTIARY HOSPITAL IN SOUTHEAST**

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**Author's contributions**

*This study was a collaborative effort of the authors. The author reviewed and approved the final version of the manuscript for publication.*

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**ABSTRACT**

Healthcare workers (HCWs) face the greatest risk of exposure to a blood-borne infection from hepatitis B virus (HBV). HCWs at a tertiary hospital were surveyed to determine their vaccination status against HBV and the reasons that may have affected their decision to get vaccinated. The research design used was descriptive cross-sectional. Healthcare workers in Alex Ekwueme Federal University Teaching Hospital Abakaliki (AEFUTHA) Ebonyi state, Nigeria, were randomly recruited from across the cadre to participate in the study. The information was gathered by use of a self-administered, standardized, and pre-tested questionnaire. SPSS version 26 was used for both descriptive and inferential data analyses. In all, 418 HCWs took part in the research. The average age was  $35.5 \pm 9.1$ , the vast majority were nurses (53.0%), and 60.3% had been in the workforce for more than 5 years. About 315 (75.4%) respondents had good knowledge of HBV infection, while 290 (69.4%) had good knowledge of the HBV vaccine. Only about 131 (31%) had received a complete vaccination of the HBV vaccine, while 45 (10.8%) had incomplete vaccination. Vaccine hesitancy was cited by 42 (10%) of respondents, and vaccine accessibility issues were cited by 35 (8.4%). This study showed that despite HCWs in AEFUTHA having a solid understanding of the virus and its vaccine, they are not taking advantage of that information by getting vaccinated against HBV. HCWs need to be informed about the dangers of contracting HBV and other blood-borne diseases through health education programs.

**Keywords:** Hepatitis B virus, Hepatitis B vaccination coverage, Healthcare Workers, Tertiary Hospital, South East Nigeria

## INTRODUCTION

People living with chronic hepatitis B virus (HBV) infections are at high risk of liver complications like Hepatocellular Carcinoma (HCC) and end-stage liver disease (Cacoub & Asselah, 2022; Iannacone & Guidotti, 2022). According to World Health Organization, 254 million people live with chronic hepatitis B infection in 2022, with an estimated 1.2 million new infections every year and 1.1 million mortalities majorly from HCC and cirrhosis (World Health Organization., 2025). Africa records a significant burden of chronic HBV, where over 60 million persons live with hepatitis B (Hepatitis | WHO | Regional Office for Africa, 2025). About 62.7% of global 1.2 million new infections of chronic Hepatitis B occurred in Africa (Cui *et al.*, 2026). Nigeria is hyper-endemic for HBV infection. A pooled HBV prevalence of 9.5% was found in a systematic review and meta-analysis of data carried out in a 2021 study (Ajuwon *et al.*, 2021). Vaccination with HBV vaccine is the safest and most economic method of eliminating HBV (Das *et al.*, 2019). One of the Sustainable Development Goals (SDG) is the elimination of viral hepatitis by 2030. Hepatitis B virus infection is common in healthcare workers (HCWs) such as surgeons, laboratory scientists, phlebotomists, nurses etc. Because of the high frequency with which these individuals are exposed to blood or other bodily fluids, contaminated medical supplies and equipment in healthcare settings, they are at an increased risk of contracting blood borne infections (Shao *et al.*, 2018a). Annually, there is an estimated 3 million percutaneous injuries among healthcare workers globally due to sharp items, with an average of four injuries per HCW (Abebaw *et al.*, 2017). A study discovered that after the first dose of a 3-dose vaccine series, healthcare workers were protected between 30% and 55% of the time, 75% of the time after the second dose, and >90% of the time after the third dose (Shefer *et al.*, 2011). This highlights the significance of hepatitis B immunizations for those working in the medical field. Healthcare workers in both poor and developed nations have been studied in an effort to quantify the status of their HBV immunization (Bedaso *et al.*, 2018; Kandi *et al.*, 2020; Yan Liu *et al.*, 2018; Ssekamatte *et al.*, 2020). The Teaching Hospital of Alex Ekwueme Federal University, Abakaliki (AEFUTHA), has not yet established a written policy for controlling the spread of hepatitis B infection, therefore its HCWs are not required to take conventional precautions against this potentially fatal virus. Little is done to raise awareness of hepatitis B other than the annual July 28 hospital commemoration of World Hepatitis Day. Only a subset of HCWs in AEFUTHA who attended the annual hepatitis B Virus celebration were included in a study on the prevalence of HBV vaccination (Obu *et al.*, 2020). A more thorough investigation assessing the HBV status of the HCWs is thus warranted. In light of this, this study aimed to determine factors that affect vaccination uptake among HCWs at AEFUTHA Ebonyi state, Nigeria. The study's results could help shape policy regarding the screening and testing of prospective healthcare professionals.

## METHODOLOGY

### Research Design

A cross-sectional descriptive survey design was carried out among healthcare workers at AEFUTHA to assess their HBV knowledge and vaccination uptake. Data collection was carried out from 14<sup>th</sup> July to 18<sup>th</sup> August 2022.

### Study Area

The Alex Ekwueme Federal University Teaching Hospital Abakaliki (AEFUTHA) was used for the research because it is a tertiary care facility in Ebonyi State, Southeastern Nigeria. Ebonyi state has a population of almost 3 million people (as of the census in 2006). Alex Ekwueme Federal University Teaching Hospital Abakaliki (AEFUTHA), Ebonyi state is located within the state capital. The hospital operates in two locations called AEFUTHA I and II. The hospital has 4435 number of staff as of May 2017. Out of this total number of staff, 543 are doctors, 1087 are nurses, 99 are pharmacists, 56 are physiotherapists, 150 are medical laboratory scientists and 28 are radiologists. AEFUTHA has a virology center located at AEFUTHA II. The center serves as a treatment center in Southeastern part of Nigeria. It has a bed capacity of 27. There is an isolation ward situated close to the accident & emergency unit of the hospital, which is managed by a Non-Governmental Organization called Doctors Without Border. There is also another tertiary institution in the state called National Obstetrics Fistula Centre (NOFIC).

### Population for the study

Health professionals from Alex Ekwueme Federal University Teaching Hospital Abakaliki (AEFUTHA) in Ebonyi state participated in the study. One who provides healthcare services or assists with the upkeep of healthcare facilities is considered a healthcare worker. Every day, healthcare personnel, especially doctors, nurses, laboratory scientists, pharmacists, physiotherapists and radiographers, are exposed to the hepatitis B virus. These people have a higher frequency with which they come into contact with blood and other bodily fluids in hospitals during their work. Those

in the medical field who work with patients frequently risk exposure to potentially infectious bodily fluids. Participants are eligible if they are involved in clinical services. Non practicing healthcare workers and those who refused consent were excluded.

### Sample and Sampling techniques

Sample size was calculated using Cochran sample size,  $n = Z^2 pq/d^2$

Where:  $n$  = Minimum sample size  $z = 1.96$  (95% CI),

$P = 26.1\%$ ; the proportion of healthcare workers who received hepatitis B vaccination in AEFUTHA, Ebonyi State (Obu et al.2020)  $q = 1-p$ , which is  $(1-0.261)$

Desired precision,  $d = 0.05$ ,

Minimum sample size,  $n = (1.96)^2 \times 0.261 \times 0.739 / (0.05)^2 = 296.3$

An anticipated 20% non-response rate was added, resulting to 370 participants.

Further adjustment was made to increase the sample size to 450 to make the study more robust and increase the study power.

### Sampling technique

A stratified random sampling method with a proportional allocation component was used to pick the participants. The sampling frame consisted of the hospital's staff list collected from the human resources department. Six (6) HCW units provide clinical services. Thus, the list of staffs (sample frames) determined the number of participants selected by proportionate allocation. Sample frames from the individual 6 units were taken as  $a+b+c+d+e+f$  to make a total sample population,  $T$ . To get the proportionate sample sizes,  $n_i$  to  $n_{vi}$ , from the individual unit was made from the relations,  $a/T*n$ ,  $b/T*n$ ,  $c/T*n$ ,  $d/T*n$ ,  $e/T*n$ ,  $f/T*n$ , respectively;

Where:  
 $n$  = the earlier calculated study sample (450) and  $T$ = total population of the 6 healthcare workers in the 6 units, the allocated sample sizes for each cadre were calculated as follows:

Table 1. Proportional Allocation of the Study Sample Across Healthcare Worker Cadres

Healthcare Worker Category	Population ( $N_i$ )	Calculation	Allocated Sample ( $n_i - n_{vi}$ )
Doctors	543	$(543 \times 450)/1959$	125
Nurses	1,083	$(1083 \times 450)/1959$	249
Laboratory Scientists	150	$(150 \times 450)/1959$	34
Pharmacists	99	$(99 \times 450)/1959$	23
Physiotherapists	56	$(56 \times 450)/1959$	13
Radiographers	28	$(28 \times 450)/1959$	6
<b>Total</b>	<b>1,959</b>		<b>450</b>

### Methods of Data Collection

The data were collected with a structured self-administered questionnaire from eligible participants. Preliminary testing of the questionnaire was conducted among eligible HCWs at a different, non-selected site to ensure its validity. Data collection was conducted over a period of five weeks. Frequencies, correctness, consistency, missing values, and variables were examined during the data cleaning process. After the initial completed questionnaire was reviewed, any logical or consistency flaws found during data entry were fixed. The data were exported into Statistical Product and Service Solution (IBM-SPSS) for Microsoft Window version 26. In a way to ensure confidentiality of information which were collected from the participants, data were stored safely and securely in protected laptop using a password which was only accessible to data entry assistants.

### Questionnaire

Age, sex, marital status, religion, and clinical factors such as designation, job unit/location, and years of experience were collected in the first section of the questionnaire. The second part of the survey inquired into the respondent's knowledge level on hepatitis B virus and hepatitis B vaccine. Knowledge was assessed using structured questions scored as correct or incorrect. The hepatitis B vaccine's uptake and its linked association were evaluated in the

survey's final portion.

### **Measurement of variables**

Clinical factors such as job unit, designation, and years of experience are examples of independent variables. Other independent variables include participants' age, sex, marital status, and religion. Vaccination for hepatitis B may be related to these factors. Knowledge of hepatitis B infection and its vaccine (Appendix 1; section B) and the percentage of healthcare workers who get vaccinated against hepatitis B (Appendix 1; section C) are the dependent/outcome variables. Frequency and percentage were calculated for categorical data; means and standard deviations for numeric variables. Hepatitis B vaccination rates were calculated using yes/no questions.

### **Data analyses**

The data were analysed using IBM-SPSS. Univariate analysis included tallying up the percentages and frequencies of each respondent's gender, work division, and job title. The mean age of our respondents was calculated. Percentages of vaccine awareness and uptake against hepatitis B were also determined using the scoring system. SPSS was used to generate the tables and charts that displayed the data. Respondents were tested with ten questions designed to gauge their familiarity with the topic of Hepatitis B virus infection. A point was awarded for each correct answer and none for each incorrect one. The percentages were calculated over a ten-point scale for each respondent's level of knowledge. Scores less than 50% were categorized as low knowledge of hepatitis B virus infection, whereas scores of 50% and above were categorized as high knowledge of HBV infection. A similar battery of eight questions was used to evaluate respondents' understanding of the Hepatitis B vaccine. One point was awarded for accurate answer and none for incorrect ones. Each respondent's total Hepatitis B vaccine knowledge score was calculated as a percentage of a maximum possible score of 8. Scores less than 50% were categorized as low knowledge of the Hepatitis B vaccine, whereas scores of 50% and above were categorized as high knowledge about the vaccine. There were three groups of responders used to measure uptake: fully vaccinated, partially vaccinated, and unvaccinated. HCWs are considered "fully vaccinated" against hepatitis B if they have received all three doses of the recommended vaccine. Respondents were categorized as partially vaccinated if they received only one or two doses.

Age, sex, marital status, work unit and designation, years of work experience, and education level were all considered independent factors in a bivariate analysis to establish their relationship to the three dependent variables (hepatitis B knowledge, hepatitis B vaccine knowledge, and hepatitis B vaccination uptake). Each independent variable has its own odds ratio and confidence interval determined. To account for any confounding, the bivariately associated variables were entered into a multivariate regression model. Those factors that proved relevant at the bivariate level were taken into account while developing a binary Logistic regression model (Multivariate analysis). An adjusted odd ratio (AOR), a 95% confidence interval (CI), and a probability value for each explanatory variable were calculated. Statistical significance was set at  $p \leq 0.05$ . Those factors that remained significant after multivariate analysis were deemed to be associated with HCWs at AEFUTHA Ebonyi State Nigeria receiving the hepatitis B vaccine.

### **Dissemination activities**

The results of this study will be disseminated through open access online publications, health talks given to participants, and presentations made to policy/decision makers at the health facility and the state ministry of health.

### **Validity/reliability of instrument**

A pre-test was conducted before the main study among health care workers in National Obstetric Fistula Centre (NOFIC) which is another tertiary institution in Ebonyi state. The questionnaire was pretested on 40 randomly selected subjects to detect any deficiencies or ambiguities of the study instrument.

### **Ethical considerations**

Approval was gotten from Research and Ethics Committee of AEFUTHA (AE-FUTHA/REC/VOL 3/2022/075) (Appendix 3). The Rivers State Ethics and Research Committee at the University of Port-Harcourt's School of Public Health also gave their approval to the study. This study was carried out under the strict guidelines and regulations of local ethical protocols including the Declaration of Helsinki. The interviewers ensured the respondents' rights, privacy, and confidentiality were protected at all times. Participation was voluntary and participants signed an informed consent form indicating their agreement to participate.

## RESULTS

This study was carried out in AEFUTHA, Ebony state assessing the HBV vaccination status among HCWs in the facility. A total of 450 questionnaires were distributed out of which 32 were excluded due to missing data (22) or non-response (10), giving a response rate of 93%.

**Table 2a: Socio-demographic Characteristics of participants (n=418)**

Variables	Frequency	Percentage (%)
<b>Age(years)</b>		
20-29	129	30.9
30-39	155	37.1
40-49	92	22.0
50-59	38	9.1
60-69	4	1.0
Mean Age	35.53(±9.1)	
<b>Religion</b>		
Christianity	416	99.5
Traditional Religion	0	0
Islam	2	0.5
<b>Sex</b>		
Male	138	33.0
Female	280	67.0
<b>Marital Status</b>		
Married	258	61.7
Single	150	35.9
Separated	1	0.2
Widowed	8	1.9
Divorced	1	0.2
<b>Designation</b>		
Doctor	120	28.7
Nurse	222	53.1
Laboratory Scientist	33	7.9
Pharmacist	22	5.3
Physiotherapist	7	1.7
Radiographer	14	3.3

The mean age of respondents was 35.5 (+/- 9.1) years, with 155 respondents (37.1% of the total) falling between the 30-39 age bracket. Almost all 416(99.5%) were of Christians religion while more than half 258 (61.7%) were married and of the nursing profession 222(53.1 %).

**Table 2b: Socio-demographic Characteristics of participants Continuation (n=418)**

Variables	Frequency	Percentage (%)
<b>Job Units</b>		
GOPD	17	4.1
A/E	34	8.1
MOPC	17	4.1
Theatre	12	2.9
SOPC	4	1.0

Labor ward	24	5.7
Adult ICU	4	1.0
Pediatric ICU	37	8.9
Isolation	30	7.0
Pharmacy	14	3.3
TBL Clinic	27	6.5
CCCRN	8	1.9
Dental Clinic	15	3.6
Others (Gynae ward, Paedo ward, GOPC)	202	48.3
<b>Years of Practice(years)</b>		
< 5	166	39.7
≥ 5	252	60.3

**Key:** GOPD= General Out Patient Department, A/E= Accident and Emergency, MOPC= Medical OutPatient Department, SOPC= Surgical Outpatient Department, ICU =Intensive Care Unit, TBL =Tuberculosis/Buruli Ulcer and Leprosy Unit, CCCRN= Center for Clinical Care and Clinical Research Newborn care unit, gynecology ward, family planning clinic, postnatal ward medical and surgical wards' staff made up the largest group of respondents (202; 48.3%). Also, more than half 252 (60.3%) of the respondents had more than 5 years' job experience.

<b>Table 3: Knowledge of Hepatitis B infection among respondents</b>	<b>Yes n (%)</b>	<b>No n (%)</b>	<b>I don't know n (%)</b>
Knowledge of Hepatitis B virus			
Prevalence of Hepatitis B virus is highest in Sub-Saharan Africa (SSA) and East Asia	267(63.9)	14 (3.3)	137 (32.8)
Hepatitis B virus is 50–100 times more infectious than HIV	326 (78.0)	43 (10.3)	49 (11.7)
Are you aware you are more at risk of contracting Hepatitis B infection than the general public?	383 (91.6)	21 (5.0)	14 (3.3)
Needle-stick injury can predispose one to Hepatitis B infection	397 (95.0)	14 (3.3)	7 (1.7)
All Hepatitis B surface antigen (HBsAg) positive individuals are infectious	301 (72.0)	80 (19.1)	37 (8.9)
Can people be chronic carriers of Hepatitis B virus without showing symptoms?	299 (71.5)	87 (20.8)	32 (7.7)
About 30% of those with chronic infection go on to develop liver disease	349 (83.5)	17 (4.1)	52 (12.4)
Is there a known virologic cure for Hepatitis B infection?	160 (38.3)	189 (45.2)	69 (16.5)
Is there an antiviral treatment to reduce the transmission risk of Hepatitis B virus disease?	313 (74.9)	47 (11.2)	58 (13.9)

Is there an antiviral treatment to decrease the likelihood of developing liver cancer?	256 (61.2)	65 (15.6)	97 (23.2)
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Key: HIV= Human Immunodeficiency Virus, HBV = Hepatitis B virus

Majority 267 (67.9%) of respondents knew that East Asia and sub-Saharan Africa have higher prevalence rates of hepatitis B than the rest of the world. Almost all the HCWs, 383 (91.6%) knew that they had a higher risk than the general population of contracting hepatitis B, while three quarter of them, 326 (78.0%) are aware that HBV is 50-100 times more infectious than HIV. About three-quarter, 301 (72.0%) of the participants are of the knowledge that HBsAg-positive persons are contagious while 397 (95.0%) knew that a needle stick injury (NSI) can predispose someone to being infected with HBV. Three quarter 299 (71.5%) of the respondents knew that chronic carriers of HBV may show no symptoms while majority 349 (83.5%) of them knew that 30% of HBV carriers go on to develop liver disease.

**Table 4: Knowledge level of Hepatitis B Vaccine amongst respondents**  
Knowledge of Hepatitis B Vaccine Responses by n=418(%)

Knowledge of Hepatitis B Vaccine	Yes	No	Don't Know
Hepatitis B infection can be prevented by vaccination	397(95.0)	9(2.2)	12(2.9)
Hepatitis B vaccine if taken within 24hrs of exposure to body fluids serve as Post Exposure Prophylaxis	282(67.5)	52(12.4)	84(20.1)
Three doses of hepatitis B vaccine given at 0, 1 and 6 months offer complete protection	302(72.0)	47(11.2)	69(16.5)
Hepatitis B vaccine can be administered simultaneously with the immunoglobulin when there is an indication	217(51.9)	40(9.6)	161(38.5)
Hepatitis B vaccine is effective to treat patients with acute hepatitis B infection	125(29.9)	217(51.9)	75(17.9)
Hepatitis B vaccine is recommended for all health care workers	397(95.0)	12(2.9)	9(2.2)
Although a full course of the hepatitis B vaccine can provide lifetime immunity, a booster shot is advised after 5 years.	328(78.5)	23(5.5)	67(16.0)
Following a completed course of hepatitis B vaccination, a blood test is needed to confirm immunity against hepatitis B virus	272(65.1)	52(12.4)	94(22.5)

Three hundred and ninety-seven (95.0%) of respondents were aware of the efficacy of vaccination against hepatitis B infection, 282 (67.5%) were under the false impression that the vaccine can be used as post-exposure prophylaxis if administered within 24 hours of exposure. Three hundred and two of them (72.5% of the total) responded correctly that the recommended vaccination schedule calls for three doses, at months 0, 1, and 6. Less than a third of respondents (125, or 20.9%) were wrong in their belief that hepatitis B vaccine could be used to treat patients with

acute hepatitis infection, while about half (217, or 51.9%) were aware that the vaccine can be delivered simultaneously with the immunoglobulin when it is appropriate. A whopping 397 (95.5%) of respondents agreed that the Hepatitis B vaccine should be required for everybody working in the healthcare industry. Additionally, over half, 272 (65.1%) of respondents agreed that a blood test is needed to confirm immunity following a completed dose of hepatitis B vaccine, while over three-quarters, 328 (78.5%) of respondents were aware that a full course of vaccination is recommended for all healthcare workers with 1 booster dose after 5 years.

**Table 5: Multivariate analysis with binary Logistic regression of Socio-demographic factors associated with Knowledge of Hepatitis B Infection**

Variable	Adjusted Ratio	Odds	(95% CI)	P-value
<b>Age(years)</b>				
≥35	1.064		0.548-2.065	
<b>Marital Status</b>				
Others	1.681		0.920-3.072	0.091
Married	1			
<b>Designation</b>				
Others	0.893		0.538-1.483	0.662
Doctors	1			
<b>Years of Experience</b>				
≥5 years	0.661		0.330-1.326	0.244
<5 years	1			

\* Statistical significance, AOR = Adjusted Odd Ratio, CI = Confidence Interval

Health Care Workers younger than 35 had a 1.06 higher likelihood of having excellent knowledge of HBV infection than HCWs older than this age group. HCWs who are single are 1.68 times more likely to have excellent understanding of HBV infection than those who are married. In comparison to medical professionals, other types of HCWs like nurses, physiotherapist, pharmacists, lab scientists and radiographers were 1.11 times less likely to have good knowledge of HBV infection. When compared to HCWs with more than five years of experience, those with fewer than five years of experience were 1.5 times less likely to have adequate knowledge of HBV infection. However, statistical significance was not observed for any of these variables.

**Table 6: Factors affecting Uptake of Hepatitis B Vaccines among respondents**

Variable	Incomplete Uptake ((%)	Complete Uptake ((%)	$\chi^2$	P-value

<b>Age(years)</b> <35	43(44.3)	54(55.7)	0.674	0.412
≥35	59(39.1)	92(60.9)		
<b>Religion</b> Christianity	102(41.1)	146(58.9)	-	-
Islam	0(0.0)	0(0.0)		
<b>Sex</b> Male	39(45.3)	47(54.7)	0.968	0.325
Female	63(38.9)	99(61.1)		
<b>Marital Status</b> Married	61(36.1)	108(63.9)	5.553	0.018*
Others	41(51.9)	38(48.1)		
<b>Designation</b> High Risk Health workers	92(39.8)	139(60.2)	2.360	0.124
Low Risk Health worker	10(58.8)	7(41.2)		
<b>Job Unit</b> Clinics	67(39.0)	105(61.0)	1.097	0.295
Wards	35(48.1)	41(53.9)		
<b>Years of job</b>				
<b>Experience</b> <5 years	42(58.3)	30(41.7)	12.402	0.001*
≥5 years	60(34.1)	116(65.9)		
<b>Knowledge of Hep B infection</b> Poor Knowledge	22(37.9)	36(62.1)	0.320	0.572
Good Knowledge	80(42.1)	110(57.9)		
Knowledge of Hep B Vaccine Poor Knowledge	35(44.3)	44(55.7)	0.483	0.487
Good Knowledge	102(60.4)	67(39.6)		

\*Statistically significant, Ft= Fishers exact,  $\chi^2$  =Chi square value,  $p < 0.05$

It was noted that various factors affected hepatitis B vaccination uptake among the HCWs in AEFUTHA and these

factors include age  $\geq 35$  years, female gender, high risk category, working in the clinic, having poor knowledge of hepatitis B infection and good knowledge of HBV vaccine. However, these factors were not statistically significant. On the other hand, being married ( $p=0.018$ ) and having a job experience of  $\geq 5$  years ( $p=0.001$ ) were other influencing factors on HBV vaccination uptake, and these were found to be statistically significant.

## DISCUSSION

In this study, HCWs at AEFUTHA were surveyed about their knowledge of the hepatitis B virus and its vaccination, the level of vaccination uptake, and the factors that affect the uptake of the hepatitis B virus vaccination. The mean age of respondents in the current study was significantly higher when compared to the mean ages of respondents in other documented studies (Abdela *et al.*, 2016; Abebaw *et al.*, 2017; Ayalew & Horsa, 2017; Maina & Bii, 2020). Because of their close proximity to the healthcare facility, it is reasonable to believe that HCWs should have sufficient understanding of diseases and other factors that affect people's health. The results of this study tend to back up this conclusion, as most respondents indicated a high awareness of the prevalence of hepatitis B infection among HCWs, the risks level associated with it, and the techniques that may be employed to avoid it. It was shown that the majority of healthcare workers had a solid understanding of the HBV infection, which is generally considered to be a positive sign. This amount of knowledge was shown to vary depending on the person's age group, the sector of healthcare they worked in, and their job description. These findings are consistent with those obtained from an additional study of the same nature that was carried out in Yobe state, Nigeria (Dayyab, Iliyasu, Ahmad, & Bako, 2020). A similar study carried out in Obafemi Awolowo Ile Ife, Osun state showed high knowledge level among healthcare workers (Adekanle *et al.*, 2015a). Another study done in Sierra Leone found poor knowledge level of HBV (Qin *et al.*, 2018). According to research conducted in Hawassa, Southern Ethiopia (Bedaso *et al.*, 2018), only 120 (49.8%) of healthcare personnel had adequate understanding of the hepatitis B vaccine, and only 146 (60.6%) had adequate knowledge of hepatitis B infection. This study recorded a far higher proportion. Most people in this study got the right answer when asked where hepatitis B is prevalent as both East Asia and sub-Saharan Africa were cited. Healthcare workers have a significantly higher risk of contracting HBV than the general population, as was agreed upon by nearly all respondents. This is in line with the results of a different study done in the Northeast of India (Sharma *et al.*, 2017), which found that the vast majority of students knew that those who work in healthcare are at risk of contracting Hepatitis B. Nearly all HCWs in a similar study in Tanzania agreed that being a HCW puts them at risk for contracting HBV (Aaron *et al.*, 2017). It is concerning, however, that the respondent believes hepatitis B infection can be cured despite the lack of evidence to support this claim. Osei *et al.* (2019) reported similar results from a study conducted in Ghana. The AEFUTHA's annual awareness event on world hepatitis B day, where HCWs are enlightened further on topics relevant to hepatitis B, is likely responsible for the high degree of understanding about hepatitis B infection among the HCWs. Moreover, this study showed that respondents who knew both about hepatitis B infection and immunization scored higher on both measures. The World Health Organization suggests that healthcare workers get vaccinated against HBV as a first line of defense against the disease (Global Health Sector Strategy on Viral Hepatitis 2016-2021. Towards Ending Viral Hepatitis, 2016.). Although most HCWs in this study knew a lot about HBV, their vaccination uptake was low. This low vaccination uptake rate is worrisome because HCWs are prone to accidental exposure to blood, and its products during the course of their work. The observed low rate could be attributed to the fact most of the respondents believe they are cautious enough not to contract any infection during the course of their work. This study recorded a high number of respondents who practice gloves wearing during the course of carrying out their medical work. It has been discovered that most HCWs who commence the hepatitis B vaccination series do not complete it (Abiola *et al.*, 2013; Ogoina *et al.*, 2014). The Centres for Disease Control and Prevention (CDC) recommends that all HCWs get vaccinated against hepatitis B using a three-dose series of vaccines (Shefer A, Atkinson W, Friedman C, Kuhar DT, Mootrey G, Bialek SR, n.d.). After the first dosage of this vaccine, protection is predicted to be between 30 and 55%; 75 and 90% at second dose; and greater than 90% at third dose. Only about a third of the HCWs in this study had really gotten all three vaccination series. However, since three doses are required for full protection against HBV, they are at a significant risk of being infected with the virus. This is also in consonance with findings from studies conducted in Sudan and Enugu, where HBV vaccination uptake among HCWs was equally low (Alege *et al.*, 2020; Omotowo *et al.*, 2018). Nevertheless, higher HBV vaccination uptake was demonstrated in a study conducted in China (Yuan *et al.*, 2019) and another in Kenya (Kisangau *et al.*, 2018). In this study, it was also observed that among the HCWs who had not received any form of vaccination, a great number of them said they will receive the vaccine in future. Lack of knowledge about the availability of the vaccine or the locations where to receive it were cited as factors for not getting immunized at all in this study. Many insist they

aren't worried about getting it. A survey conducted in Kenya found that respondents' reasons for not getting vaccinated ranged from a lack of information and vaccine availability to healthcare providers' safety concerns and a general dislike of injections (Kisangau *et al.*, 2018 ;Aaron *et al.*, 2017). A little more than a third of the people who participated in the survey had a history of unintended contact to patient blood or blood products; however, only a minute percentage of those people had later been treated with hepatitis B immunoglobulin. This study found that older HCWs in AEFUTHA were less likely to receive vaccination against HBV. A larger percentage of respondents between the ages of 30 and 39. had received the HBV vaccine, albeit this difference was not statistically significant across age categories. There was no discernible distinction between the two groups, statistically speaking. This is probably because all health care workers, whatever of age, are mandated by WHO guidelines to get vaccinated. Similar results were obtained in a study conducted in Addis Ababa (Belete, 2016). Since older persons have been shown to have a reduced reaction to hepatitis B immunization, age is another factor that affects the vaccine's immunogenicity (Hepatitis B). Female HCWs were shown to have a higher vaccination rate than their male counterparts in this study. Therefore, men are less likely than women to seek medical attention, and to utilize healthcare services (Hunt *et al.*, 2011). Ochu *et al.* found that women had a 2.28-fold higher risk of receiving the entire dose of hepatitis B vaccine than men did in their study of safe workers (Ochu & Beynon, 2017). Another factor which affected the HBV vaccination uptake among HCWs was marital status. Those HCWs who were married were found to have better uptake level of HBV vaccine more than the unmarried ones. This increase in uptake level among the married could be attributed to the fact that married people have better health seeking behavior in order to protect their family. The length of time a HCWs had been in the field also played a significant role in determining their immunization rates; where workers with more years of experience were more likely to have gotten all of the required immunizations, according to the findings of this study and others (Ogoina *et al.*, 2014). This may be because the vaccine was only intermittently distributed by the government, preventing inoculation among newly hired healthcare staff. Similarly, the longer one spends in the workforce, the more time one spends engaging in various dangerous behaviors and the greater the likelihood that one may get an illness.

## CONCLUSION

This research showed that only a small percentage of HCWs in AEFUTHA had received the hepatitis B vaccine. However, a larger percentage of responders demonstrated extensive knowledge of both hepatitis B virus infection and the hepatitis B vaccine. The results of this research may affect how healthcare is provided in the future. Everyone has a role to play in raising HCWs' consciousness about the importance of optimizing their HBV immunization rates. These findings suggest the need for the management of AEFUTHA to ensure the hepatitis B vaccine protocol is made available in the hospital. There should be health awareness programs on initiating and completing vaccination among HCWS.

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