

Hepatitis B vaccine uptake among primary healthcare workers in the federal capital territory, Abuja, Nigeria

Abstract

Introduction: Hepatitis B virus is one of the most common blood-borne infections, can infect healthcare personnel through needle punctures, cuts from sharp instruments, or mucocutaneous contact with an infected person's bodily fluids. If an unvaccinated person comes into contact with blood or bodily fluid infected with HBV, their chance of contracting hepatitis B infection ranges from 6% to 30%. This study aims to determine the uptake of the Hepatitis B vaccine among healthcare workers in the federal capital territory's primary healthcare facilities.

Methodology: A facility-based descriptive cross-sectional study design was used. This study included 198 healthcare workers in PHC facilities who are in regular contact with patients and their body fluid samples, encompassing doctors, nurses, Laboratory scientist/laboratory technicians, Community health extension workers and Community health officers. Pharmacists, record officers and administrative staff were excluded because of their reduced risk of exposure to body fluids. Statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) version 23.

Results: The findings of this study showed that 34.6% (66) of the respondents had gotten all three doses of the recommended vaccination, 35.6% (68) had received just a partial vaccine, while 29.8% (47) had received none. Factors such as age, years of experience, and accessibility to vaccination services were significant influencers of vaccine uptake.

Conclusion: Low HBV vaccination among primary healthcare workers poses a risk for themselves and their patients. There is an urgent need for a policy that ensures mandatory free hepatitis B vaccination for all healthcare workers.

Keywords: Hepatitis B Virus, vaccination uptake, primary healthcare workers, federal capital territory, Abuja-Nigeria

Volume 9 Issue 2 - 2025

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Received: April 22, 2025 | **Published:** May 8, 2025

Abbreviations: HBV, hepatitis B virus; WHO, world health organization; HCWs, healthcare workers; SPSS, social sciences software; AOR, adjusted odds ratio

Introduction

Hepatitis B virus (HBV) is a highly contagious pathogen of significant public health concern and can cause severe hepatic failure. It is a major contributor to liver cirrhosis and hepatocellular cancer. Globally, an estimated two billion individuals are infected with HBV, the majority of which are found in Africa and Asia. Approximately 240 million people worldwide have chronic hepatitis B viral infections.¹

The vaccination of healthcare workers against Hepatitis B is a critical component in mitigating the risk of transmission to patients. Recent estimates show that hepatitis accounts for approximately 1.3 million deaths annually, making it the seventh leading cause of death globally.² Hepatitis B and C are responsible for a large proportion of hepatitis mortality and morbidity, with over 90% of persons infected unaware of their condition, and as such they don't seek treatment.³ Despite well-established facts that health professionals are four times more likely than the general public to get HBV and that an estimated 600,000–800,000 cuts and puncture injuries are reported there each year, of which around half go unreported, healthcare professionals' hepatitis B vaccination rates remained low.⁴

The World Health Organization (WHO) indicates that HBV vaccine uptake among healthcare workers in low-income countries

remains low.⁵ In Africa, the full vaccination rate among healthcare workers is just 18%. Several studies have underscored this low vaccination coverage.⁵ Studies in Nigeria have reported low hepatitis B vaccination rates among healthcare workers, ranging from 20% to 50%. The reasons for non-vaccination include lack of opportunity, ignorance, and the high cost of the vaccine. Additionally, issues such as vaccine availability and absence of proper channels to prevent resource mismanagement pose significant challenges in Nigeria.^{6,7}

National and group-specific prevalence rates of HbsAg have been reported. Among the general population, the prevalence ranges from 10% to 15%, while it is 25.7% among surgeons, 23.4% among voluntary blood donors, and 16.3% among infants.⁸ Healthcare workers (HCWs) at risk of occupational percutaneous or mucosal exposures should undergo serologic testing for antibody to hepatitis B surface antigen (anti-HbsAb) 1-2 months after the final vaccine dose.⁹ Those with anti-HbsAb levels greater than 10 mIU/ml are considered to have protective immunity.¹⁰ Fully vaccinated HCWs with anti-HBs levels below 10 mIU/mL should receive an additional three doses of the hepatitis B vaccine at a higher dosage, followed by anti-HBs testing 1-2 months after the final dose.¹¹

Hepatitis B vaccine is currently part of the regular program in Botswana, Gambia, Seychelles, Swaziland, South Africa, and Zimbabwe, where the EPI-TF campaigned to introduce HEPATITIS B vaccination as early as 2000.¹² Although the World Health Organization has advised all nations to include the Hepatitis B

vaccine in their immunization programs, this is not practical in many settings with limited resources as argued by Maher, yet as part of their immunization regimens, 183 member states of the UN immunized newborns against Hepatitis B as of 2012, and 79% of the children received the vaccine.¹²

A study in Nigeria identified a low vaccine uptake among 857 healthcare workers. The majority 609 (71.1%) of the HCWs received at least one dose, with 360 (42.0%) of them received three doses (full vaccination), while 248 (28.9%) were not vaccinated.¹³ In another study in Nigeria, the rate of hepatitis B vaccination was 14.2% (n = 445). The number of doses received were: 3 doses (218/3132, 48.9%), 2 doses (71/3132, 16.0%), and one dose (156/3132, 35.1%). The reasons for non-uptake of vaccination included: cost of vaccine 48 (10.8%), 'did not believe they could be infected' 28 (6.6%), long vaccination schedule, and lack of time 150 (35.1%). The Odds for uptake of hepatitis B vaccination were 22% lower among nurses compared to doctors (AOR = 0.78, 95% CI = 0.54-0.98, P = 0.037).¹⁴ In Ethiopia, Ayalew and Horsa (2017) studied 286 healthcare workers at a university hospital and found low vaccination rates, with only 28.7% having received all three doses. Despite 94% of participants recognizing the importance of vaccination, common barriers included vaccine unavailability (58.2%) and high cost (18.5%).¹⁵ Factors such as professional role, age, education level, and marital status significantly influenced vaccine uptake.¹⁵

Studies from Nigeria, Uganda, and Tanzania reported HBV prevalence rates of 13.5%, 8.1%, and 7.5%, respectively, among healthcare workers.⁵ The national guidelines established in 2016 for the prevention, care, and treatment of HBV include vaccination of healthcare workers as a preventive measure. However, it remains unclear whether there is an implementation policy to enforce this. Studies in Nigeria have reported low hepatitis B vaccination rates among healthcare workers, ranging from 20% to 50%. The reasons for non-vaccination include lack of opportunity, ignorance, and the high cost of the vaccine. Additionally, issues such as vaccine availability and absence of proper channels to prevent resource mismanagement pose significant challenges in Nigeria. While the vaccine is highly effective in preventing HBV infection, there is currently no cure for the disease once it is established.^{15,16}

Unvaccinated healthcare workers are vulnerable to infection, potentially leading to a reduction in the healthcare workforce owing to illness or absenteeism. They can unknowingly transmit the virus to patients, compromising the quality of healthcare services and exacerbating the burden of Hepatitis B in the community. Before the 1980s, healthcare professionals faced significant occupational risks from the hepatitis B virus (HBV), with infection rates ten times higher than those in the general population. The virus was primarily transmitted through needlestick injuries and contact with infected bodily fluids via mucous membranes or broken skin. The introduction of the HBV vaccine in 1981 significantly reduced infection rates among vaccinated healthcare workers.¹⁷ To prevent HBV transmission among healthcare workers, measures such as mandatory vaccination with post-vaccination testing and booster doses for non-responders are implemented. Standard precautions include hand hygiene, the use of personal protective equipment (PPE), and safe handling of sharps. Needleless systems and proper waste disposal further reduce exposure risks. In the event of accidental exposure, immediate wound care and post-exposure prophylaxis with HBIG and vaccination help prevent infection. Ongoing training and the use of safety-engineered devices offer additional protection.¹⁷ This study sought to determine the predictors of HBV uptake among healthcare workers in the FCT to apply the findings for policymaking and practice.

Material and methods

Study location

The study was conducted in Abuja, the capital city of Nigeria, which comprises of six area councils. The Federal Capital Territory (FCT) has 656 healthcare facilities, consisting of 559 Primary Health Care facilities, 90 Secondary Health Care facilities, and seven tertiary healthcare facilities. Specifically, the Abuja Municipal Area Council, is the focus of this study, has 58 primary health facilities and employs 243 healthcare workers across various cadres.

Study design

A facility-based descriptive cross-sectional design was used in this study. This study design was implemented because it allows for the collection of information from primary healthcare workers in relation to their knowledge of HBV and uptake of the vaccine.

Study population

This study included all healthcare workers within the FCT working in PHC facilities who were in regular contact with patients and their body fluid samples, including doctors, nurses, laboratory scientist/laboratory technicians, ward assistants, CHEW (community health extension workers) and CHO (community health officers). Pharmacists were excluded because of their reduced risk of exposure to bodily fluids.

Sample size estimation

The minimum sample size was determined using a modified leslie-kish, Fisher's et.al statistical formula for calculating sample size.

$$n = \frac{Z^2 \cdot P \cdot (1 - P)}{E^2}$$

Z= 1.96 i.e., value of the standard distribution corresponding to a significance level of a (1.96 for a 2-sided test at the 0.05 level),

P= proportion 86.6% of HCWs aware of vaccine in previous study.¹⁸

E= tolerable margin error, set at 0.05.

$$\frac{1.96^2 \times 0.866 \times (1 - 0.866)}{0.05^2} = 178.33$$

Our parameters included an estimated proportion of 86.6% of HCWs who were aware of the hepatitis vaccine, a confidence level of 95%, and a precision of 5%. This led to the calculation of a minimum sample size of 178 participants, thus setting the foundation for a statistically robust study.

Final sample size= Effective sample size/ (1- non-response rate anticipated)

$$\frac{178}{1 - 0.10} = 197.78$$

adjusted = 198

Sampling

All 58 health facilities were included in this study. Given the limited population size of the departments and the unpredictable availability of participants, any staff member present in the office at the time of the study who met the inclusion criteria—specifically, having worked in the facility for a minimum of one year—was interviewed. Health record officers, pharmacists and administrative staff were excluded.

Data collection tool

Data were obtained from 191 study participants (health workers) involving the 12 wards in the Abuja Municipal Area Council using

a pre-tested, structured, self-administered questionnaire derived from previous research. The questionnaire was developed to include all important factors for the study's aims. It was designed in English, considering that English is the national language of the country and a requirement for employment at hospitals in the area; therefore, no accommodations were made for other languages. Completed questionnaires were collected and reviewed for their accuracy.

Data analysis

Statistical analyses were performed using Statistical Package for the Social Sciences software (SPSS). Descriptive statistics were used to summarize the demographic characteristics, knowledge levels, and vaccine uptake rates. Frequency tables and charts were used to summarize the sociodemographic characteristics and doses of HBV vaccines received. Vaccination status was verified through self-reporting with the aid of a questionnaire and interview, where the participant was asked to recall their vaccination status and the number of doses taken. Binary logistic regression was used to determine variables that independently predicted partial or no vaccination and was expressed as an adjusted odds ratio (AOR) with a 95% confidence interval. For all tests, a p-value of less than 0.05 was considered significant.

Ethical consideration

Ethical approval was obtained from the FCTA Ethical Review Committee. The participants were provided with comprehensive information regarding the study's goals, methods, risks, and benefits, with an emphasis on voluntary participation. Confidentiality was preserved, and all obtained data were anonymized and securely kept.

Results

Table 1 outlines the knowledge of hepatitis B vaccine among 191 health workers in primary healthcare settings, and approximately half of the respondents were aware of the existence of an effective vaccine for hepatitis B (HBV). Regarding its efficacy, 85.9% believed that the vaccine provides over 90% protection against HBV, in contrast with 14.1% (27 individuals) who hold differing views.

Table 1 Knowledge of Hepatitis B Vaccine among health workers in primary healthcare facilities

Knowledge of Hepatitis B Vaccine	Frequency (n = 191)
There is an effective vaccine for HBV	
No	10(5.2)
Yes	181(94.8)
HBV vaccine provides more than 90% protection against HBV	
No	27(14.1)
Yes	164(85.9)
For how long does the HBV vaccine provide immunity?	
For 3 years	23(12.0)
At 10 years	55(28.8)
At least 20 years	74(38.7)
Do not know	39(20.4)
Do you know your status with HBV (immunized, susceptible, or chronic carrier)?	
No	78(40.8)
Yes	113(59.2)
If yes, what is your status?	
Immune infection	6(3.1)
Immune vaccine	74(38.7)

Susceptible	33(17.3)
NA	78(40.8)
High	139
Low	52

*NA = Not applicable.

The analysis revealed the vaccination status of 191 interviewed healthcare workers. The majority were not vaccinated, accounting for 57 (29.8%), while 68 (35.6%) were partially vaccinated, and only 66 (34.6%) had received the full three doses of the vaccine, as illustrated in Figure 1.

UPTAKE OF HEPATITIS B VACCINE

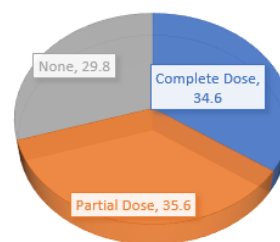


Figure 1 vaccination status of primary healthcare workers in the FCT.

Table 2 provides insights into the factors influencing the uptake of the hepatitis B vaccine among 191 healthcare workers in primary healthcare settings. First, more than half of the respondents stated that the hepatitis B vaccine is readily available at their primary healthcare centres, while a sizeable portion did not specify its availability. Regarding accessibility, one-third found the vaccine easily accessible at their healthcare centres, with 6.3% facing challenges in accessibility.

Table 2 Factors Influencing the Uptake of Hepatitis B Vaccine Among Health Workers in Primary Healthcare Settings

Factors Influencing the Uptake of Hepatitis B	Frequency (%)
Hepatitis B vaccine availability at primary healthcare centre.	
Yes	125(65.4)
No	9(4.7)
NA	57(29.8)
Witnessed cases of hepatitis B infection among healthcare workers in your workplace.	
Yes	129(67.5)
No	5(2.6)
NA	57(29.8)
Hepatitis B vaccine easily accessible at primary healthcare centre.	
Yes	122(63.9)
No	12(6.3)
NA	57(29.8)
Logistical challenges in obtaining the hepatitis B vaccine at workplace (e.g., scheduling, waiting times)	
Yes	113(59.2)
No	21(11.0)
NA	57(29.8)
The vaccine is not readily available	
Yes	13(6.8)
No	44(23.0)
NA	134(70.2)

Table 2 Continued...

The cost of vaccines is high	
Yes	10(5.2)
No	47(24.6)
NA	134(70.2)
I hate injections	
Yes	18(9.4)
No	39(20.4)
NA	134(70.2)
The time between the doses is prolonged	
Yes	48(25.1)
No	9(4.7)
NA	134(80.2)
I have suffered from hepatitis B infection before	
Yes	6(3.1)
No	51(26.7)
NA	134(70.2)

*NA = Not applicable.

Table 3 highlights the significant associations between various factors and vaccine uptake among health workers. Occupation showed

Table 3 Vaccine uptake according to sociodemographic characteristics among health workers in primary healthcare facilities

Variables	Uptake (Doses)					χ^2	df	p-value
	0 (n=47)	1 (n=26)	2 (n=42)	3 (n=66)	Total (n=191)			
Occupation								
CHEW	49 (42.6)	12 (10.4)	18 (15.7)	36 (31.3)	115	72.66	12	0.001*
CHO	5 (20.8)	4 (16.7)	4 (16.7)	11 (45.8)	24			
Doctor	0 (0.0)	0 (0.0)	0 (0.0)	1 (100)	1			
Laboratory Scientist	0 (0.0)	10 (50.0)	1 (5.0)	9 (45.0)	20			
Nurse	3 (9.7)	0 (0.0)	19 (61.3)	9 (29.0)	31			
Age range (years)								
22 – 32	29 (34.1)	6 (7.1)	12 (14.1)	38 (44.7)	85	33.442	9	0.001*
33 – 43	18 (30.0)	13 (21.7)	11 (18.3)	18 (20.0)	60			
44 – 54	5 (15.6)	3 (9.4)	17 (53.1)	7 (21.9)	32			
55 – 65	5 (35.7)	4 (28.6)	2 (14.3)	3 (21.4)	14			
Years of experience								
1 – 8	46 (37.4)	14 (11.4)	20 (16.3)	43 (35.0)	123	26.963	9	0.001*
16-Sep	4 (11.4)	6 (17.1)	10 (28.6)	15 (42.9)	35			
17 – 24	6 (26.1)	2 (8.7)	11 (47.8)	4 (17.4)	23			
25 – 32	1 (10.0)	4 (40.0)	1(10.0)	4(40.0)	10			
Gender								
Female	20 (16.4)	11 (9.0)	35 (28.7)	56 (45.9)	122	45.185	3	0.001*
Male	37 (53.6)	15 (21.7)	7 (10.1)	10 (14.5)	69			
Marital status								
Single	30 (33.7)	6 (6.7)	12 (13.5)	41 (46.1)	89	18.49	3	0.001*
Married	27 (26.5)	20 (19.6)	30 (29.4)	25 (24.5)	102			
Religion								
Christian	29 (26.1)	13 (11.7)	21 (18.9)	48 (43.2)	111	8.856	3	0.031*
Muslim	28 (35.0)	13 (16.2)	21 (26.2)	18 (22.5)	80			

*Statistically significant (p<0.05) n = 191

a strong link ($\chi^2 = 72.660$, $p = 0.001$) with all doctors vaccinated, while uptake varied among other roles. Age was also significant ($\chi^2 = 33.442$, $p = 0.001$), with younger workers (22-32) having higher vaccination rates. Experience matters ($\chi^2 = 26.963$, $p = 0.001$), with those having 9-16 years of experience showing higher uptake. Gender differences were notable ($\chi^2 = 45.185$, $p = 0.001$), with females being more likely to be vaccinated. Marital status predicted uptake ($\chi^2 = 18.490$, $p = 0.001$), with single workers having higher rates. Religion was also associated ($\chi^2 = 8.856$, $p = 0.031$), and Christians were more likely to be vaccinated than Muslims.

Table 4 presents the uptake of vaccines among health workers in primary healthcare facilities, analyzed according to their knowledge and risk perception regarding the vaccine. In terms of knowledge, the findings revealed a clear distinction between health workers with good and poor knowledge. Among those with good knowledge, a significant proportion received three doses of the vaccine (37.1%), whereas a notable percentage (30.9%) did not receive any doses. Conversely, among health workers with poor knowledge, most received only one dose (53.8%) and none received three doses, indicating that knowledge plays a crucial role in vaccine uptake.

Table 4 Uptake of Vaccine based on knowledge and risk perception among health workers in primary healthcare facilities

Variables	Uptake (Doses)					χ^2	df	p-value
	0 (n=47)	1 (n=26)	2 (n=42)	3 (n=66)	Total (n=191)			
Knowledge of Health Workers								
Good	55 (30.9)	19 (10.7)	38 (21.3)	66 (37.1)	178	22.874	3	0.001*
Poor	2 (15.4)	7 (53.8)	4 (30.8)	0 (0.0)	13			
Risk Perception								
Positive	30 (57.7)	12 (23.1)	7 (13.5)	3 (5.8)	52	42.769	3	0.001*
Negative	27 (19.4)	14 (10.1)	35 (25.2)	63 (45.3)	139			

*Statistically significant (p<0.05)

When examining risk perception, the results showed a striking pattern. Health workers with a positive risk perception exhibited a high rate of non-uptake, with 57.7% having received no doses at all and only a small percentage (5.8%) having received three doses. In contrast, those with a negative risk perception had better vaccine uptake, with 45.3% having received three doses.

Table 5 presents a logistic regression analysis of factors influencing Hepatitis B vaccine uptake among health workers in primary healthcare facilities, showing that occupation significantly affected vaccine uptake. Health workers in certain occupations were substantially less likely to be vaccinated (regression coefficient:

-2.847, adjusted odds ratio: 0.058, 95% CI: 0.013-0.253, p = 0.001). Gender also is a significant predictor of vaccine uptake. One gender is vastly more likely to be vaccinated (regression coefficient: 3.184, adjusted odds ratio: 24.154, 95% CI: 7.682-75.949, p = 0.001). Religion significantly influenced vaccine uptake. Health workers with certain religious affiliations were over four times more likely to be vaccinated (regression coefficient, 1.436; adjusted odds ratio, 4.206; 95% CI: 1.620-10.918, p = 0.003). The constant Term indicates low baseline odds of vaccine uptake among health workers when all other variables are held constant (regression coefficient: -3.251, adjusted odds ratio: 0.039, p = 0.004).

Table 5 Logistic regression of Hepatitis B vaccine uptake among health workers in primary healthcare facilities

Predictor variable	B	SE	Wald	p-value	Adj. OR	95% CI	
						Lower	Upper
Occupation	-2.847	0.752	14.336	0.001	0.058	0.013	0.253
Years of Experience	-0.442	0.385	1.32	0.251	0.643	0.302	1.366
Gender	3.184	0.585	29.682	0.001	24.154	7.682	75.949
Religion	1.436	0.487	8.709	0.003	4.206	1.62	10.918
Constant	-3.251	1.118	8.45	0.004	0.039		

* Statistically significant β = Regression coefficient; SE = Standard error; Adj. OR = Adjusted Odds ratio

Table 6 below indicates that occupation (p = 0.015), and gender (p = 0.001) are significant predictors of Hepatitis B vaccine uptake among healthcare workers. Specifically, certain occupations are more likely to be vaccinated, and female healthcare workers are more likely

to receive the vaccine compared to their male counterparts. Age, years of experience, marital status, and religion did not significantly influence the vaccine uptake.

Table 6 Logistic regression of factors influencing vaccine uptake by associated factors

Predictor variable	β	SE	Wald	p-value	Adj. OR	95% CI	
						Lower	Upper
Occupation							
(Clinical Health Workers/ Laboratory Personnel)	0.344	0.141	5.963	0.015*	1.411	1.07	1.861
Age (≥ 22 / < 65)	-0.463	0.371	1.558	0.212	0.629	0.304	1.302
Years of Experience (≥ 1 / < 32)	0.457	0.371	1.521	0.217	1.58	0.764	3.268
Gender (Female/Male)	-1.353	0.344	15.46	0.001*	0.259	0.132	0.507
Marital Status (Single/Married)	0.225	0.449	0.252	0.616	1.252	0.52	3.017
Religion (Christian/Muslim)	-0.42	0.346	1.477	0.224	0.657	0.333	1.294
Constant	2.144	0.767	7.816	0.005	8.531		

Discussion

This study assessed the uptake of Hepatitis B Virus (HBV) vaccine among primary healthcare workers in Abuja, Nigeria, revealing significant gaps in the vaccination coverage and identifying key predictors of uptake. The findings in this study align with global and regional trends, where low HBV vaccination rates among healthcare

workers (HCW) persists despite the well documented occupational risks of HBV infection.^{3,6}

Knowledge and vaccine uptake

The study found that 94.8% of HCWs were aware of the HBV vaccine, and 85.9% recognized its high efficacy (>90% protection).

However, only 34.6% had completed the full three-dose regimen, like rates reported in other Nigerian studies.^{13,14} This disparity between knowledge and practice underscores systemic barriers, such as vaccine cost, accessibility, and logistical challenges (e.g. prolonged dosing schedules), which were cited by the 35.1% of unvaccinated respondents. Similar barriers have been reported in Ethiopia and Tanzania,⁹ which suggests a regional pattern of underutilization despite a general awareness of the vaccine.

Sociodemographic predictors

Regarding occupation, doctors had the highest vaccine uptake (100%), while nurses and CHEWs had lower rates 29% and 31.3% respectively. This aligns with Nigerian studies where nurses were 22% less likely to be vaccinated than doctors.¹⁴ Occupational disparities may reflect differences in training, risk perception, or institutional support.

Regarding gender, females were significantly more likely to be vaccinated (45.9%) compared to males (14.5%), a trend also observed in Uganda,⁹ potentially stemming from gendered health-seeking behaviour. In terms of age and experience, younger HCWs (22-32 years) and those with 1-8 years of experience had higher vaccine uptake, possibly due to training initiatives or institutional vaccine programmes targeting new employees.

Structural and systemic barriers

Despite 65.4% of HCWs reporting vaccine availability at their facilities, cost (cited by 10.8%) and logistical hurdles (e.g. scheduling conflicts, 25.1%) remained deterrents. These findings are similar a study in Nigeria highlighting the mismanagement of resources and lack of enforced vaccination policies.¹³ In contrast to countries such as Botswana and South Africa, where HBV vaccination is integrated into national programmes, achieving higher coverage,⁶ emphasizing the need for policy reform in Nigeria.

Risk perception and misconceptions

Notably, HCWs with a 'positive' risk perception (aware of HBV severity) had 'lower' vaccine uptake (57.7% unvaccinated), whereas those with a 'negative' perception had higher uptake (45.3% fully vaccinated). This paradoxical finding suggests that fear of HBV may not translate to action without institutional support or that vaccinated individuals underestimate their risk post immunization. Misconceptions, such as 'I cannot be infected' (6.6%), further hinder uptake, as seen in a study.¹⁵

Limitations of the study: participants were not screened for HBV immunoglobulin level to determine their vaccination status nor was any evidence of vaccination demanded. The study relied solely on the participant's ability to recollect their vaccination history.

Conclusion

This study reveals that suboptimal HBV vaccine uptake among Nigerian HCWs is due to the complex interaction of knowledge gaps, occupational disparities, gender dynamics, and systemic barriers, such as cost and accessibility. While awareness is high, translation into practice is hampered by structural inefficiencies and lack of enforced policies.

Recommendations

The Federal and State governments should mandate HBV vaccination for all HCWs, aligning with Nigeria's 2016 national

guidelines, and integrate vaccination programmes into routine occupational health programmes.

- I. The Federal and State Governments should subsidize HBV vaccines to eliminate cost barriers.
- II. Workplace interventions, such as on-site vaccination drives to address logistical challenges and regular training to correct misconceptions and reinforce risk awareness, should be implemented in all healthcare facilities across the country.
- III. The Federal and State ministries of health should embark on targeted campaigns to prioritize high-risk groups such as nurses, CHEWs, and males, who demonstrated lower vaccine uptake
- IV. The management of healthcare facilities should establish tracking systems to ensure that HCWs complete the three-dose regimen and receive post-vaccination serological testing (anti-HBsAb) for monitoring and accountability.

By addressing these barriers, Nigeria can protect its healthcare workforce, reduce nosocomial HBV transmission, and advance toward the WHO's 2030 elimination targets.³

Acknowledgements

We wish to appreciate the support of the primary health healthcare workers in the FCT, particularly in the municipal, for their support. The help of the M&E and immunization officers of the area councils are equally acknowledged.

Conflict of interest

The authors declare no conflict of interest.

Funding

self-funded.

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