

Knowledge, Attitudes, and Uptake of Hepatitis B Vaccination among Nursing Students in Ilorin, Kwara State; A Cross-Sectional Study

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ABSTRACT

Background: Hepatitis B virus (HBV) infection is a preventable viral liver infection that remains a significant global public health problem and occupational health risk for Nursing Students. Nursing students in high-endemic settings like Nigeria face repeated exposure to bloodborne pathogens, yet vaccination uptake is often low despite the availability of highly effective vaccine.

Aim: To assess knowledge of HBV and its vaccine, attitudes toward vaccination, and vaccine utilization among undergraduate nursing students in Ilorin, Nigeria.

Method: A cross-sectional survey was conducted among 329 nursing students undergoing clinical training at four Ilorin institutions (two universities and two nursing colleges). Participants were selected via multistage sampling. Data were collected with a structured self-administered questionnaire (via Google Forms) assessing demographics, HBV knowledge, attitudes (Likert scale), and vaccination status. Data were analyzed using SPSS version 31. Descriptive statistics (frequencies and percentages) summarized participant characteristics and responses, chi-square tests examined associations (significance $p < 0.05$).

Results: The majority of students were female (67.2%) and aged 16–20 years (45.0%). Knowledge about HBV was generally high: 84.5% correctly identified HBV as a virus, 86.6% knew contaminated needles can transmit HBV, 75.1% recognized jaundice and fatigue as symptoms, and 75.4% knew the 0,1,6-month vaccine schedule. Attitudes were positive overall as 45.9% strongly agreed they were at risk if unvaccinated, and 45.0% strongly believed HBV vaccine provides protection. However, only 201 students (61.1%) had received at least one vaccine dose. Among those vaccinated, just 76 (37.8%) completed the full three-dose series (23.1% of all respondents). In total, 128 students (38.9%) had never been vaccinated. The most frequently reported reasons for not being vaccinated were high vaccine cost (46.1% of unvaccinated), fear of side effects (40.6%), limited access to the vaccine (36.7%), and lack of an institutional vaccination policy (32.8%). Chi-square tests indicated that both higher knowledge and more positive attitudes were significantly associated with being vaccinated ($p < .01$), whereas financial and institutional barriers correlated with non-vaccination ($p < .05$).

Conclusion: *Nursing students in Ilorin demonstrated good HBV knowledge and positive attitudes, but vaccination coverage was suboptimal. Fewer than one-quarter completed the recommended three-dose regimen. Structural barriers especially cost, access, and absence of mandatory policies hindered vaccine utilization.*

Recommendation: *It is recommended that nursing institutions and the Nursing and Midwifery Council of Nigeria (NMCN) establish and enforce mandatory vaccination policies, subsidized or free on-campus vaccination programs, strengthen awareness programmes to protect students and enhance occupational health standards.*

Keywords: Hepatitis B Virus, Knowledge, Attitude, Utilisation, Barriers, Vaccination, Nursing Students, Kwara State, Nigeria.

INTRODUCTION

Hepatitis B virus (HBV) infection is a vaccine-preventable liver disease that remains a major global public health concern, capable of causing both acute illness and chronic complications such as cirrhosis, hepatocellular carcinoma, and liver failure¹. Globally, over 250 million people are living with chronic HBV infection, with approximately 1.2 million new infections and 1.1 million deaths recorded annually². Africa bears a disproportionate burden, with an estimated 65 million chronically infected individuals, prevalence rates of 5–10% in the general population, and approximately 272,000 deaths each year^{3,4}. Nigeria is classified as highly endemic, with a prevalence of about 9.5% and an estimated 14.4 million people living with chronic infection^{5,6}.

HBV is highly infectious, remaining viable on surfaces for up to seven days and being 50–100 times more transmissible than HIV and significantly more than hepatitis C virus. This high infectivity places healthcare workers and nursing students at increased risk due to frequent exposure to blood and body fluids during clinical procedures⁷. In Sub-Saharan Africa, HBV prevalence among healthcare workers and students ranges from 6.8% to 8.0%, often exceeding that of the general population^{8,4}. In Nigeria, reported prevalence among this group varies widely from 1.1% to 25.7%⁶. Despite the availability of an effective vaccine, uptake among healthcare students remains suboptimal, with studies reporting complete vaccination coverage as low as 4.6% and national estimates around 42%⁹.

Although national guidelines recommend vaccination for all healthcare workers and students, implementation remains inconsistent due to limited vaccine availability, cost barriers, and lack of institutional enforcement. Evidence from Kwara State also suggests low levels of HBV awareness, indicating potential knowledge gaps among nursing students¹⁰. Inadequate vaccination among this high-risk group poses significant consequences, including increased risk of chronic infection, potential nosocomial transmission, and challenges to Nigeria's goal of eliminating viral hepatitis by 2030.

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Despite extensive documentation of HBV burden and vaccine uptake in Nigeria, there is limited evidence specifically addressing the knowledge, attitudes, and vaccine utilization among nursing students in Ilorin, Kwara State. Existing studies largely focus on healthcare workers or medical students, leaving a critical gap. This study addresses this gap by examining these factors among nursing students in Ilorin, with the aim of informing targeted interventions, strengthening nursing education, and improving occupational health policies.

METHODS

Study design and setting

A cross-sectional descriptive research design was adopted to provide a snapshot of the current vaccination status and perceptions among the study population. This study was carried out in Ilorin metropolis, the capital city of Kwara State, located in the North-Central geopolitical zone of Nigeria. Ilorin is a major urban metropolis with an estimated land area of 35,705 square kilometres and a population of 2,371,089 residents.¹¹ As a prominent educational and healthcare hub in the region, Ilorin hosts multiple universities, specialist hospitals, and teaching facilities that attract students and patients from across the state and neighbouring regions, making it an ideal setting for studying nursing students exposed to clinical environments. This concentration of accredited nursing programs facilitates access to a diverse sample of students within a defined geographical area, justifying its selection as the study site for assessing nursing students exposed to clinical environments.

The study targeted four purposively selected institutions offering accredited nursing education programs in Ilorin, Kwara State: The Department of Nursing Sciences at the University of Ilorin, Al-Hikmah University, Kwara State College of Nursing Sciences, and the University of Ilorin Teaching Hospital College of Nursing Sciences.

These institutions were chosen based on their accreditation by relevant nursing regulatory bodies, offering Bachelor of Nursing Science and/or diploma-level programs, and their affiliation with tertiary and secondary care facilities. This ensures students' regular exposure to clinical placements, which heightens their occupational risk of Hepatitis B virus exposure, making them a relevant population for this study. The diversity of these institutions, encompassing both private and public, universities and colleges enhance the representativeness of the sample within Ilorin's educational and healthcare landscape.

Population and sample size:

The target population for this study comprises all nursing students enrolled in the selected accredited institutions during the 2024/2025 academic year, with an estimated total of approximately 1,351 students. This population includes Bachelor of Nursing Science students from 200 to 500 levels at the Department of Nursing Sciences, University of Ilorin, and Faculty of Nursing Sciences, Al-Hikmah University, as well as second and third-year students in diploma programs at the University of Ilorin Teaching Hospital College of Nursing Sciences and Kwara State College of Nursing Sciences. A sample size of 329 was determined using the Cochran's formula for finite populations.

A multi-stage sampling technique was used to select participants, ensuring that all selected institutions and levels are represented, sample sizes in each stratum reflect their relative sizes (proportionate allocation) and individual selection is random within strata, minimizing selection bias and supporting generalizability.

Instrument for Data Collection

A structured, self-administered questionnaire was developed and validated. It comprised four sections: Section A: Demographic Information (Questions 1–5)-collects data on age, gender, institution, level/year of study, and monthly family income. Section B: Exposure & Institutional Information (Questions 6–9)-assesses clinical exposure frequency, institutional provision of vaccination, presence of a vaccination policy, and institutional offers of vaccination. Section C: Knowledge of HBV and Vaccination (Questions 10–16)-comprises 7 items using multiple-choice and true/false formats to assess understanding of HBV cause, transmission, symptoms, risk factors, and vaccination protocols. Knowledge Levels: Good knowledge $\geq 70\%$ (5–7 points), Moderate knowledge 50% - 60% (4 points) and Poor knowledge $\leq 50\%$ (0–3 points). Section D: Attitudes and Barriers Toward HBV Vaccination (Questions 17–27) Includes 11 items on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) comprising of attitudes questions (17–22, 6 items) that measures risk perception, vaccine effectiveness, self-efficacy, and necessity (Item 21 will be reverse-coded). A mean score ≥ 3.0 indicates a positive attitude, < 3.0 indicates a negative attitude. Barriers Questions (23–27, 5 items) that assesses cost, access, side effects, and institutional policy barriers. Higher mean scores indicate greater perceived barriers. Section E: Vaccination Utilization (Questions 28–31) Contains 5 items to assess vaccination status, including receipt of any dose, number of doses, completion of the 3-dose schedule, and reasons for non-utilization. Section F: Sources of Information (Questions 32) Includes 1 item to identify sources of information which supports identifying influencing factors.

Validity and Reliability of instrument.

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The instrument used for data collection was subjected to both content validation and reliability testing. Content validity was established through an expert review conducted by the three research experts (two nursing educators and one public health specialist) from Al-Hikmah University, Ilorin. Their feedback was used to refine the questionnaire items, ensuring comprehensive coverage of the constructs and alignment with the study's objectives.

Reliability was assessed through a pilot study conducted with 33 nursing students from Kwara State College of Nursing, Oke Ode which is not included in the main study. This was used to evaluate the internal consistency using SPSS V31 reliability scale and a Cronbach's Alpha of 0.89 was obtained. This shows that the instrument is reliable.

Method of Data Collection

Prior to data collection, Ethical clearance from the Ethics Committee of the selected institutions was sought after presenting an Introduction letter outlining the study's nature. The survey link was sent through WhatsApp to participants. The mobile-optimized survey includes an electronic consent form and clear instructions. Participants were informed about the study's objectives and that responses are anonymous and confidential to encourage honest answers, with no identifiers collected.

Method of Data Analysis

Data were exported from Google Forms and analyzed using SPSS v.31. Descriptive statistics (frequencies, percentages) summarized characteristics, knowledge responses, attitudes, and vaccination status. Attitude items were averaged to compute a mean attitude score. Vaccination status categories [unvaccinated, partially vaccinated (1–2 doses), fully vaccinated (3 doses)] were tabulated. The chi-square (χ^2) test was used to examine associations between vaccination status (vaccinated vs. not) and categorical factors including knowledge level and attitude (high vs. low), as well as reported barriers. Statistical significance was set at $p < .05$. Tables and figures follow APA style conventions.

Ethical Considerations:

Ethical approval was sought by obtaining a letter of introduction from the Faculty of Nursing Science, which was submitted to the ethical review committees of Al-Hikmah University, University of Ilorin, the University of Ilorin Teaching Hospital (UITH), and the Kwara State College of Nursing, Ilorin to obtain permission to conduct the research. Informed consent was obtained from all participants prior to the administration of the questionnaire. Participants' privacy and confidentiality were ensured through the use of anonymous questionnaires and secure storage of collected data. Participation was entirely

voluntary, and respondents were informed of their right to decline participation without any consequences. Throughout the study, the study adhered to the Declaration of Helsinki principles governing human participants.

RESULTS

Socio-Demographics characteristics

Tables 1 summarizes respondent demographics. Among 329 students, most were aged 16–20 (45.0%) or 21–25 years (35.0%). The majority were female (67.2%). Students were drawn fairly evenly from the four institutions (26.7–32.2% each). Academic levels ranged from 200 level through Year 3 of diploma, with the largest group in second year of the college program (24.3%).

Table 1: Socio-demographic data of the respondents

Characteristic	Frequency	Percent
Age (years)		
16–20	148	45.0
21–25	115	35.0
26–30	44	13.4
>30	22	6.7
Gender		
Male	108	32.8
Female	221	67.2
Institution		
Al-Hikmah University (Nursing)	88	26.7
University of Ilorin (Nursing Dept.)	104	31.6
UITH College of Nursing	31	9.4
Kwara State College of Nursing	106	32.2
Academic level		
Univ 200 level	63	19.2
Univ 300 level	56	17.0
Univ 400 level	38	11.6
Univ 500 level	35	10.6
College Year 2	80	24.3
College Year 3	57	17.3

Exposure & Institutional Information

Table 2 revealed that 108(32.8%) of the respondents sometimes perform or assist with procedures that expose them to blood or body fluids during clinical placements,

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87(26.4%) often do it for several times or week, 60(18.2%) do it daily (i.e., very often), 46(14%) rarely do it while 28(8.5%) have never done it. This suggests that most respondents are frequently at occupational risk of exposure to hepatitis B infection during their clinical training.

Table 2: Frequency of Exposure to Procedures Involving Blood/Body Fluids

Response Option	Frequency	Percent
Never	28	8.5
Rarely (monthly)	46	14.0
Sometimes (weekly)	108	32.8
Often (several times/week)	87	26.4
Very often (daily)	60	18.2
Total	329	100.0

Table 3 revealed that 88(26.7%) of respondents indicated that their institutions subsidise hepatitis B vaccination, while 72(21.9%) reported that it is provided free of charge. However, 64(19.5%) said vaccination was available at full cost, and 61(18.5%) stated that vaccination services were not available on campus. Meanwhile, 44(13.4%) were unsure of the availability. This suggests that although most institutions offer some form of hepatitis B vaccination service, financial and informational barriers still exist.

Table 3: Institutional Provision of Hepatitis B Vaccination or Clinics for Students

Response Option	Frequency	Percent
Yes — free to students	72	21.9
Yes — subsidised (students pay part)	88	26.7
Yes — full cost to student	64	19.5
No — not available on campus	61	18.5
Don't know	44	13.4
Total	329	100.0

Table 4 revealed that 112(34%) of respondents reported that hepatitis B vaccination is strongly recommended but not mandatory, while 103(31.3%) stated that it is mandatory for clinical placement. In contrast, 67(20.4%) indicated no policy exists in their institutions, and 47(14.3%) were unaware of any policy. This indicates that while most

institutions acknowledge the importance of vaccination, enforcement of a mandatory policy remains inconsistent.

Table 4: Availability and placement of written policy or requirements for hepatitis B vaccination in Facilities

Response Option	Frequency	Percent
Yes — mandatory for placement	103	31.3
Yes — strongly recommended but not mandatory	112	34.0
No policy exists	67	20.4
Unsure policy existence in facility	47	14.3
Total	329	100.0

Table 5 revealed that 139(42.2%) of respondents reported that they received hepatitis B vaccination on campus, while 81(24.6%) were offered but did not take it, possibly due to personal or financial reasons. Meanwhile, 109(33.2%) said they had never been offered the vaccine. This reflects a relatively moderate institutional effort toward vaccination uptake, but highlights that a significant portion of students remain unvaccinated or unprotected against hepatitis B infection.

Table 5: Have you ever been offered vaccination by your school/college (on-campus or organized clinic)?

Response Option	Frequency	Percent
Yes — I received it on campus	139	42.2
Yes — offered but I did not take it	81	24.6
No	109	33.2
Total	329	100.0

HBV knowledge and attitudes

Most students demonstrated good knowledge of HBV. 84.5% correctly identified HBV as a viral infection and 86.6% recognized sharing contaminated needles as a transmission route. Three-quarters (75.4%) knew the recommended three-dose vaccination schedule (at 0, 1, and 6 months). About two-thirds understood common symptoms (jaundice, fatigue). However, detailed immunological knowledge was lower: only 41.6% knew the protective antibody threshold (≥ 10 mIU/mL).

Attitudes toward HBV vaccination were generally favorable (overall mean $\sim 3.8/5$). In particular, 45.9% of students strongly agreed they were at risk for HBV if unvaccinated,

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and 49.5% strongly agreed HBV is a serious condition. Likewise, 45.0% strongly believed vaccination provides protection. Over 43% agreed that encouragement from lecturers or supervisors would motivate them to vaccinate. These findings indicate a positive orientation toward vaccination, consistent with models of health behavior.

Vaccination utilization and barriers

Despite good knowledge and attitudes, HBV vaccine utilization was suboptimal. Overall, 201 students (61.1%) reported receiving at least one vaccine dose, while 128 (38.9%) had never been vaccinated. However, most students did not complete the series: among those who initiated vaccination (n=201), only 76 (37.8%) received all three doses. This corresponds to 23.1% of the total sample (Table 2). Partial vaccination (one or two doses) was reported by the remainder (38.0% of all students).

Table 6. Hepatitis B vaccination status (n=329)

Dose count	Frequency	Percent
None (unvaccinated)	128	38.9
One dose only	48	14.6
Two doses only	67	20.4
Three doses (complete)	76	23.1

Among unvaccinated students and those not completing the series, key barriers emerged. The most cited obstacle was the high cost of the vaccine (46.1% of unvaccinated students). Fear of side effects or injections was reported by 40.6%, and limited access (e.g. availability at campus clinics) by 36.7%. A lack of an institutional vaccination policy or mandate was noted by 32.8% (Table 3). These results suggest that economic and structural factors strongly inhibit vaccine uptake.

Table 7. Reported barriers to hepatitis B vaccination (among unvaccinated students, n=128)

Barrier	Frequency	Percent
High vaccine cost	59	46.1
Fear of side effects/injections	52	40.6
Limited access to vaccine	47	36.7
No institutional vaccination policy	42	32.8

DISCUSSION

The study found that although most nursing students demonstrated good awareness of hepatitis B virus (HBV) and its vaccine, significant gaps persisted between knowledge, attitude and actual vaccination behavior. While a large proportion correctly identified

HBV as a viral infection, recognized major transmission routes, and knew the 0–1–6-month schedule, fewer students completed the full three-dose series showing a clear knowledge-utilization gap. These findings mirror patterns reported in other Nigerian and regional studies where theoretical awareness does not automatically translate into complete vaccine adherence.^{9,13}

Misconceptions and incomplete technical knowledge were evident in specific items (for example, uncertainty about the minimum protective antibody level and occasional incorrect beliefs about casual contact or booster needs). Such gaps are important because partial or incorrect knowledge can produce false reassurance and reduce the perceived urgency to complete the vaccination series.^{5,2}

Although attitudes toward vaccination were positive with many students perceiving themselves at risk and agreeing vaccine is protective, structural and practical barriers predominated as determinants of behavior. High cost, limited access (absence of on-campus services), and weak or inconsistently enforced institutional policies were the most frequently cited reasons for not initiating or completing vaccination. This indicates that individual-level interventions (lectures, awareness campaigns) will be insufficient unless coupled with policies and systems that remove financial and logistical obstacles.⁶

Statistical associations in this study reinforce these interpretations, as higher knowledge and more positive attitudes were significantly associated with vaccine uptake, yet cost, access, and policy factors were also significantly associated with non-utilization. In practical terms, knowledge and attitude appear necessary but not sufficient conditions for adequate vaccination coverage, enabling institutional frameworks and affordable delivery are required to convert intention into action.¹³

Parity of findings across the four institutions studied suggests the problem is systemic across training settings in Ilorin rather than isolated to a single school. That said, variation in institutional provision (free, subsidised, full-cost, or unavailable) points to actionable institutional levers: where schools subsidised or made vaccines available on campus, uptake was relatively better. These programmatic observations provide a clear route for intervention: align curriculum education with on-site, low-cost vaccine delivery and enforceable placement requirements to protect students and patients alike.

IMPLICATIONS FOR NURSING

The results have immediate implications for nursing education, practice, and administration. Nursing educators should continue and intensify HBV education in curricula, focusing not only on basic facts but on the practical steps required to achieve protection (e.g., the importance of completing all three doses and documentation).

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Clinical supervisors and nurse administrators should incorporate vaccination status checks into clinical placement processes and use supervisory influence to encourage completion. Administratively, nursing schools must move from ad hoc awareness campaigns to institutionalized vaccination programs, ideally free or subsidized on campus with robust record-keeping, follow-up for missed doses, and clear policy statements that link vaccination to safe clinical practice. Finally, nurses and nursing students can act as advocates for workplace immunization, helping to normalise vaccination as a professional standard and public-health expectation.

LIMITATIONS OF THE STUDY

This study relied on self-reported data for vaccination status and attitudes, which may be subject to recall bias and social desirability bias; some respondents might have misremembered or misreported doses. The cross-sectional design provides a snapshot in time and cannot establish causality between knowledge, attitude, and vaccine uptake. Although the sample covered four major training institutions in Ilorin, the findings may not be generalizable to all nursing students in Nigeria or to other healthcare student populations. Finally, the study did not include serological testing to confirm immune protection; reported completion of three doses was not verified by antibody titres or vaccine records in all cases. These limitations should be considered when interpreting the results.

RECOMMENDATIONS

Institutions should implement mandatory HBV vaccination policies for students prior to clinical placement, with clear documentation requirements and enforcement mechanisms. Nursing schools, in partnership with state health authorities and professional bodies (e.g., NMCN), should provide free or heavily subsidized on-campus vaccination drives to remove cost and access barriers.

Integrate practical vaccination logistics into orientation and clinical-placement checklists (e.g., vaccine record submission, scheduled campus clinics, automated reminders for dose completion).

Strengthen record-keeping and follow-up systems so students who miss scheduled doses are traced and supported to complete the series.

Combine continued curriculum education with targeted counselling addressing specific misconceptions (e.g., antibody thresholds, booster myths, transmission routes) and promote post-vaccination serology where feasible for high-risk trainees.

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