



Hepatitis B Virus Infection: Knowledge, Misconceptions, and Preventive Practices among Undergraduate Students of Al-Hikmah University, Ilorin, Nigeria

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Abstract

Original Research Article

Background: There is high endemicity of hepatitis B virus (HBV) in Nigeria, but there is low utilization of prevention strategies among university students. The high awareness rate of hepatitis B vaccine does not appear to be translated to knowledge and even practice, indicating a knowledge-practice disparity.

Objective: To assess the level of knowledge, misconceptions, attitudes, and prevention practices toward HBV among students of Al-Hikmah University, Ilorin, and find out sociodemographic determinants.

Methods: This was a cross-sectional study carried out on 409 undergraduate students, recruited through multi-stage sampling technique, and data was collected using a pretested, structured, self-administered questionnaire. Data analysis was done by using SPSS, while knowledge, misconception, and attitude scores were calculated. Associations were tested using chi-square and logistic regression tests, considering P-value less than 0.05 as significant.

Results: In total, 43.8% had poor knowledge of HBV, while only 18.6% had good knowledge; additionally, 66.3% had moderate-to-high misconceptions about transmission. While 78.2% knew about HBV vaccine, only 17.8% were fully vaccinated, resulting in a 60.4% knowledge-practice discrepancy. Misconceptions included mosquito bites (37.9%) and sharing food from plates (41.8%), and 45.0% shared sharp objects. Positive attitude towards vaccination was 51.1%. Good knowledge was independently predicted by age ≥ 25 (AOR=3.91), health-related faculty students (AOR=2.15), and 400L–500L level (AOR=1.87); additionally, having health faculty predicted reduced misconceptions score.

Conclusion: Despite high awareness about vaccines, knowledge levels of HBV were low, there were a lot of misconceptions, and only few students were fully vaccinated. Knowledge regarding HBV was influenced by academic factors and not gender. There is a need for curricula-based intervention, subsidized vaccination at the University Health Centre, and peer-led campaigns to address the knowledge-practice disparity.

Keywords: Attitude, Hepatitis B virus, Knowledge, Misconception, Undergraduates, Vaccination.

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Introduction

Infection with the Hepatitis B virus (HBV) is a big threat to health in all countries. According to the World Health Organization (WHO), about 254 million people had chronic hepatitis B virus infection, and there were 1.2 million new infections per year (1) globally. The largest number of cases is seen in the Western Pacific Region and the African Region, with 97 million and 65 million patients, respectively. This disease is also known to cause 30% and 57% of cases of liver cirrhosis and cancer (2,3). Another important issue related to HBV is co-infection with HIV. About 1% of patients with hepatitis B also have HIV infection; there are 2.7 million patients, while the prevalence rate of hepatitis B virus infection among those who have HIV infection is 7.4% (1). The WHO recommends using antiretroviral therapy for any patient with HIV starting from 2015 without consideration of the condition of their disease, and hence, Tenofovir, which is a drug used to treat patients with HIV infection, is also effective in treating patients with hepatitis B virus infection too (1,3).

Worldwide, HBV is the most common cause of liver disease, with the WHO aiming to eradicate viral hepatitis by 2030. However, even with the existence of an effective and safe vaccine since 1982, many high-prevalence areas still have low vaccination rates (4). Infection with the hepatitis B virus does not present any symptoms in about 50-70% of cases in older children and adults (5). Those infected with HBV who present symptoms usually experience them between 120 days and five years after the infection (6). In two-thirds (66.7%) of those infected, there are no symptoms. In other instances, patients develop icteric hepatitis, which can progress into fulminant hepatic failure (2,3). Because of the absence of symptoms in people with HBV, the infection can be easily passed from one individual to another due to sexual intercourse or sharing of personal belongings without knowledge of having the disease (7).

The prevalence of the Hepatitis B virus (HBV) in Nigeria has been reported to be between 8-12% making Nigeria a hyper-endemic country in terms of the infection. This clearly indicates that

millions of people are at risk from the infection and its complications (6), which have serious implications for the delivery of health care services and the nation's economy. The latest national data indicate that the Nigerian state is hyper-endemic for the HBV infection with a prevalence of 9.5% among the general population and an even higher prevalence among some selected high-risk populations (14). As stated by researchers, quite a number of individuals among the 20 million Nigerians who suffer from the viral infection do not know of their status, putting themselves at great risk for transmission of the disease and its complications (7). According to scientific evidence, the virus is vertically transmitted due to poor vaccination and screening coverage as well as high-risk practices using sharps (8). Inadequate integration of hepatitis B birth-dose vaccination into routine immunization and low adult catch-up vaccination further sustains transmission (4).

Hepatitis B virus is a public health problem in Nigeria due to high prevalence rates. While there are different vaccines and medicines for curing this disease, the level of information among the Nigerian undergraduate students regarding transmission, preventive measures, and treatment of HBV is low. Information about the Hepatitis B virus is vital for preventing this disease, and more is needed. Public health campaigns aimed at increasing knowledge about this problem can be significantly affected by the spread of misinformation in society (9). There have been a number of surveys carried out in Nigerian universities showing that knowledge of HBV remains very poor, low vaccine uptake, and the presence of misconceptions regarding the transmission modes of the disease (15,16). The age group that makes up the majority of university students is the youth; hence, many studies conducted have shown a high level of Hepatitis B prevalence among this group. This is because the youth take part in risky activities, which make them contract Hepatitis B infection (10). Such risky behaviors include unprotected sex, sexual activity with different partners, sharing of razors and clippers, tattooing, and body piercing; all of which are rampant among undergraduate students (12,14).

It is necessary to assess the awareness level of the students regarding this matter, since this will be vital in developing proper plans and formulating an effective health education programme. The information gathered from this study will be useful in designing education and screening programmes in order to achieve the objectives set by the Nigerian government for hepatitis elimination (11). Since they will become the leaders of tomorrow, undergraduate students must be provided with proper knowledge about HBV to help them prevent themselves from getting infected and also to teach other people how to avoid being infected by this virus (17). Information management in healthcare includes managing good information regarding health issues as well as eliminating misconceptions about them. Therefore, this study is aimed at assessing the level of knowledge, misconceptions, attitude, and preventive practices related to hepatitis B virus infections among undergraduate students of Al-Hikmah University, Ilorin, and sociodemographic correlates associated with them.

Materials and Methods

Study Design and Setting

A school-based descriptive cross-sectional study design was employed to assess the knowledge, attitude, misconceptions, and preventive practices regarding Hepatitis B virus (HBV) infection among undergraduate students. This study was conducted among undergraduate students of Al-Hikmah University, Ilorin, Nigeria. Founded in 2005 by Abdulraheem Oladimeji Islamic Foundation (AROIF), in collaboration with World Assembly of Muslim Youths (WAMY) and accredited by the National Universities Commission with License No. 010, Al-Hikmah University is the first-ever private Islamic faith-based university of Nigeria, offering a combination of general learning and Islamic moral education without prejudice in its admission policy (19). While having about 70 students in the 2005/2006 session, the University boasts of a student population exceeding 11,000 students in all of its courses of studies in

undergraduate, postgraduate, and the Institute of Education as of early 2025, with a total of seven faculties, including the College of Health Sciences and Postgraduate Schools in Ilorin and Igbaja campuses (18). The majority of her students are non-residential. The University Health Centre offers primary healthcare services that include, amongst others, school entry medical examinations and issue of medical fitness certificate, outpatient consultation, laboratory tests, health education, immunization, emergency, and referrals to tertiary institutions in Ilorin.

Target Population and Determination of Sample Size

All regular undergraduate students registered for the 2025/2026 academic session were the study population. Students not available for data collection, those who declined participation, or students enrolled in sandwich or part-time degree programmes were excluded from the study.

The minimum sample size for this study was estimated using Cochran's formula for cross-sectional surveys as follows:

$$n = Z^2pq / d^2$$

Where n is the minimum sample size, Z is the standard normal deviate of 1.96 at 95% confidence level, p is the estimated proportion of the students who had good knowledge of HBV infection, q = (1-p), and d is the margin of error (5%). Based on an earlier survey among Nigerian university students (9), indicating that 45.2% of the respondents had good knowledge of HBV infection, p was assumed to be 0.452. Thus, the minimum sample size required was 381. Adjusting for non-responses by 10%, the estimated sample size was 423. But a total of 409 questionnaires were completed and analyzed, implying a response rate of 96.7%. Therefore, the sample size used in this study was 409.

Sampling Technique

This study adopted a multistage sampling procedure to adequately capture the diversity of

the university's undergraduate population. The first step involved stratifying the entire undergraduate population into faculty units, with all the seven faculties of the university represented. The second step involved distributing the entire sample size of 409 to each faculty according to their respective student populations; therefore, faculties with larger student populations contributed more samples than smaller faculties. The third step involved employing simple random sampling, whereby departments in each faculty unit were selected randomly without replacement to give every department an equal opportunity for inclusion in the study process. The fourth step involved utilizing systematic random sampling, where individual students from the selected departments were sampled according to their class lists.

Each k^{th} student was selected based on the sampling interval from a randomly chosen starting point until the required sample size of respondents from that particular department was achieved. In using systematic random sampling, the sampling interval k was first computed to determine the selection process. This was done using the formula:

$$k = N/n$$

Where: N = Total number of eligible students in the sampling frame (that is, in a selected department); n = Number of students to be sampled in the selected department; and k = Sampling interval, rounding down to the nearest whole number. This was done as follows in this study: Proportionate allocation of the total sample size of 409 across the seven faculties gave the total number of respondents to be selected from each faculty, based on their undergraduate enrolment. In each selected faculty, the official class list of the registered undergraduate students for the 2025/2026 academic year was sourced and used as the sampling frame. Those who were either suspended, withdrawn, or in a sandwich programme were not included in the sampling frame. The value of k was calculated independently in each department using the formula above. If a selected department had $N=240$ students eligible on the class list, but only

$n=20$ were supposed to be sampled from that department, then: $k=240/20=12$. This means every 12th student on the list would be selected.

A random start from 1 to k was generated using a random number table. In case a random start of 5 was selected, then the 5th, 17th, 29th, 41st... individuals from the class list were picked until the value of n was achieved. In cases where an individual refused or was unable to respond, the subsequent individual was approached in order to maintain the required sample size. The sampling technique was applied in all sampled departments, up to 409 respondents.

Instrument and Method of Data Collection

Data was collected using a pre-tested, structured, self-administered questionnaire based on literature reviews (2,7,9,15,16). The questionnaire included five sections:

Section A: Sociodemographic characteristics – Age, gender, faculty, level of study, marital status, and place of residence.

Section B: Knowledge of Hepatitis B Virus (HBV): The knowledge of the causes of HBV, its symptoms, potential complications, ways in which it is transmitted, and how to prevent it was tested through 15 questions, each with a score of either one (1) if the answer was correct or zero (0) otherwise, with possible scores between 0-15.

Section C: Misconceptions regarding HBV transmission – based on eight Likert scale items on a five-point scale (1 = Strongly Disagree to 5 = Strongly Agree) with regards to common myths on mosquito-borne transmission, use of utensils, casual contact, and asymptomatic transmission.

Section D: Preventive practices and attitudes regarding prevention measures – based on knowledge of availability of HBV vaccine, vaccination history (dose taken, incomplete dose, no vaccination at all), willingness to be vaccinated, attitude towards compulsion of vaccination, peer effects, and risky behavior like sharp usage and testing of blood before transfusion.

Section E: Attitudes of participants towards HBV – knowledge of personal risk and attitudes associated with it were measured with a five-point Likert scale and categorically.

Content validity of the questionnaire was established through review by two public health experts and a medical microbiologist. A pilot study was carried out among 40 University of Ilorin students, and the reliability of the knowledge component was measured using Cronbach's alpha, which was found to be 0.81.

The survey was conducted over a period of three weeks from February to March 2026, utilizing the services of seven research assistants who were trained in collecting data. One assistant was appointed to cover each of the seven faculties. Participants were selected for the survey during their lecture-free hours.

Measurement of Variables

The dependent variables are level of knowledge about HBV, misconceptions, attitudes towards HBV, and preventive practices. The independent variables comprise of sociodemographic characteristics, including age, gender, faculty affiliation, academic level, and marital status.

These variables were assessed as follows: Knowledge: Using 15 items in Section B. Each correct answer earned 1 point, while an incorrect/don't know response earned 0 points. The score range is 0-15, and it was categorized as poor (0-7), fair (8-11), and good (12-15). (9) Misconceptions: Using 8 items in Section C on a scale of 1=Strongly disagree to 5= Strongly agree. Responses supporting the myth are coded as 1, whereas the other options are 0. The total score ranges from 0 to 8, with high scores indicating many myths. Attitude: Using questions in Sections D and E on a scale of 1-5, with responses supporting the positive view earning 5 points, while those rejecting the positive views earn 1. Scores between 5-12 are considered to be a negative attitude, 13-18 neutral attitudes, and 19-25 positive attitudes. (2). Preventive Practices: Categorical variables. Vaccinations are categorized into fully vaccinated (received 3 vaccines), partially vaccinated (1-2 doses), and unvaccinated. Other

practices like sharp reuse and asking about blood screenings are either Yes, No, or Not Applicable.

Composite scores were computed using 409 valid responses. Scores for knowledge ranged from 0 to 15 based on proration of six items to a total score of 15; scores for misconception ranged from 0 to 8 using proration of four Likert items to a total score of 8, and scores for attitude ranged from 5 to 25 using proration of two Likert items to a total score of 25. Frequencies and percentages were derived from individual summed scores.

Analysis of the Data

The data was entered, cleaned, and analyzed with IBM SPSS Statistics software version 26. Descriptive statistics such as frequency distributions, percentages, were used to describe data. Chi-square test of independence was performed to examine the relationships between sociodemographic variables and overall scores for knowledge and misconceptions regarding HBV infection. Where necessary, Yates' correction was applied. A p-value < 0.05 was considered statistically significant. Binary logistic regression was conducted to identify predictors of good knowledge of HBV. The knowledge was categorized as either Good or Poor. Both crude and adjusted odds ratios with 95% confidence intervals were calculated. Those variables having p<0.05 in the multiple model were independent predictors.

Ethical Issues

Approval for the study was granted by the Ethical Review Committee of the Kwara State Ministry of Health through permission number ERC/MOH/2026/02/604. Informed consent was sought from all participants after giving them information on the purpose of the study, its advantages, and that participation was voluntary. Confidentiality was ensured by anonymity and the protection of data. Participants were not coerced or induced to participate in any way whatsoever. The level of risk associated with participating in the study was minimal, and its benefits outweighed any possible harm that may

have been encountered during the study. This study complies with the ethical guidelines of the Declaration of Helsinki. The anonymity and confidentiality of all information provided by respondents were ensured at all stages of the study, and personally identifiable information was not obtained. Students who have poor knowledge were given an HBV information leaflet afterwards, while those willing were referred to the University Health Centre for counselling and vaccination.

Results

Sociodemographic characteristics of study participants

More than one-third (38.9%) of the study participants were between the ages of 20 and 24

years, and slightly more than one-quarter were 15 to 19 years old (26.4%), and almost one-quarter were 25 to 29 years old (23.0%), whereas a minority of them was 30 years and older (11.7%). The female respondents were the majority (55.5%) in comparison to the male respondents (44.5%). According to the level of education, one-quarter was at the 300 level (25.7%). In terms of faculty affiliation, nearly one-fifth came from Computing and Engineering Technology (18.6%), Education (17.8%), and Management Science (17.6%). However, only a few respondents came from the College of Health Sciences (6.4%) despite the expected higher health literacy. Nearly two-thirds were single (63.3%) while over one-third were married (36.7%), as shown in Table 1:

Table 1: Socio-demographic characteristics of participants N=409

Variable	Frequency (n)	Percentage (%)
Age		
15-19	108	26.4
20-24	159	38.9
25-29	94	23.0
30 and above	48	11.7
Gender		
Female	227	55.5
Male	182	44.5
Level of Study		
100	82	20.0
200	81	19.8
300	105	25.7
400	97	23.7
500	44	10.8
Faculty of Study		
Education	73	17.8
Humanities and Social Sciences	44	10.8
Natural and Applied Sciences	57	13.9
Computing and Engineering Technology	76	18.6
Law	26	14.9
College of Health Sciences	61	6.4

Management Sciences	72	17.6
Marital status		
Married	150	36.7
Single	259	63.3

Knowledge of HBV among Respondents

Awareness of HBV was average. More than half were aware that HBV is caused by a virus (53.3%), while nearly one-fourth attributed it to bacteria (23.5%), and nearly one-fourth were unaware (23.2%). Nearly half were aware that HBV can result in liver damage and cancer (49.4%), but fewer than one-quarter correctly

recognized that unprotected sex, sharing of needles or blades, and transmission from mother to child during childbirth are modes of transmission of HBV (23.7%). The significant concern is that more than one-third incorrectly believed that HBV can be totally cured by antibiotics (34.7%), while less than two-fifths were aware that the liver is the principal organ affected by HBV (40.6%) as shown in Table 2a:

Table 2a: Knowledge of HBV among Respondents, N=409

Variable	Frequency (n)	Percentage (%)
HBV is caused by?		
A bacteria	96	23.5
A virus	218	53.3
I don't know	95	23.2
HBV can cause liver damage and cancer		
False	96	23.5
True	202	49.4
I don't know	111	27.1
Which of the following are modes of HBV transmission		
Eating with infected persons	30	7.3
Handshakes	28	6.8
Mother-to-child during birth	34	8.3
Mother-to-child during birth, eating with infected persons	18	4.4
Sharing needles/blades	38	9.3
Sharing needles/blades, mother-to-child during birth	41	10.0
Unprotected sex	30	7.3

Unprotected sex, sharing needles/blades, mother-to-child during birth	97	23.7
Unprotected sex, , mother-to-child during birth	15	3.7
HBV can be completely cured with antibiotics		
False	180	39.1
True	142	34.7
I don't know	107	26.2
A person infected with HBV may not show symptoms at first		
False	107	26.2
True	197	48.2
I don't know	105	25.7
Which organ of the body is mainly affected by HBV?		
Brain	69	16.9
Heart	138	33.7
Liver	166	40.6
Lungs	31	7.6

Information sources on HBV among respondents

Almost one-quarter were first exposed to HBV information through the internet and social media (23.0%), while over one-fifth indicated health workers (21.8%). Almost one-tenth each

named health campaigns or awareness activities (13.9%) and classroom or lecture-based instruction (13.9%), while almost one-tenth cited friends or peers (12.7%), and barely one-tenth listed family members (9.8%) as shown in Table 2b:

Table 2b: Main sources of information on HBV among respondents N=409

Variable	Frequency (n)	Percentage (%)
Internet/social media	94	23.0
Health workers	89	21.8
Health campaigns/awareness programmes	57	13.9
Lectures/classroom teaching	57	13.9
Friends/peers	52	12.7
Family members	40	9.8

Misconceptions about modes of transmission

The level of agreement with HBV transmission misconceptions is depicted in Table 3. The percentage range for each statement was 28.1%-41.8%, indicating that more than a quarter but less than two-fifths of respondents agreed or strongly agreed with the misconceptions. There were several misconceptions regarding

transmission of the virus, including mosquito bite (37.9%) and consuming food from the same plate (41.8%). Handshake and hug were cited by one-third of the respondents (37.9%). Almost a quarter of the respondents believed that only those looking ill could transmit the infection (28.1%). In total, between over one-quarter and two-fifths of students endorsed the myths on the mode of HBV transmission.

Table 3: Misconceptions about modes of transmission N=409

Variable	Frequency (n)	Percentage (%)
HBV can be transmitted through mosquito bites		
Strongly Disagree	99	24.2
Disagree	56	13.7
Undecided	99	24.2
Agree	74	18.1
Strongly Agree	81	19.8
HBV can be transmitted by eating from the same plate as an infected person		
Strongly Disagree	104	25.4
Disagree	61	14.9
Neutral	73	17.8
Agree	78	19.1
Strongly Agree	93	22.7
HBV can be spread through handshakes and hugging		
Strongly Disagree	110	26.9
Disagree	63	15.4
Neutral	81	19.8
Agree	81	19.8
Strongly Agree	74	18.1
Only people who look sick can transmit HBV		
Strongly Disagree	141	34.5
Disagree	76	18.6
Neutral	77	18.8
Agree	67	16.4
Strongly Agree	48	11.7

Respondents' Knowledge of HBV Prevention with Vaccine

Although over three-quarters of respondents had heard about the HBV vaccine (78.2%), the rate

of vaccination was poor, with less than one-fifth receiving the full dose of the vaccine (17.8%). On the other hand, over two-fifths had taken partial doses (43.5%), while nearly two-fifths had never gotten the vaccine (38.9%). Among

those who had not received the vaccine, over half were unwilling to receive the vaccine (53.5%). Despite low uptake, attitudes toward prevention were fairly positive, with over half believing that

HBV vaccination should be mandatory for all students (54.7%), and over two-thirds would encourage their peers to get vaccinated (68.7%) as shown in Table 4:

Table 4: Respondents’ Knowledge of HBV Prevention with Vaccine N=409

Variable	Frequency (n)	Percentage (%)
Have you heard of the HBV vaccine?		
Yes	320	78.2
No	89	21.8
Have you received the HBV Vaccine?		
No	159	38.9
Yes, full dose	72	17.8
Yes, partial dose	178	43.5
If no, are you willing to be vaccinated?		
No	85	53.5
Yes	67	42.1
I believe that HBV vaccination should be compulsory for all students		
Strongly disagree	50	12.2
Disagree	52	12.7
Neutral	83	20.3
Agree	151	36.9
Strongly agree	73	17.8
I would encourage my friends to get vaccinated against HBV.		
Strongly disagree	21	5.1
Disagree	30	7.3
Neutral	77	18.8
Agree	173	42.3
Strongly agree	108	26.4

Attitude of Participants About HBV

The risk perception among participants was low because less than one-third felt that they were susceptible to getting infected with HBV (32.0%). A serious negative practice was that

nearly half admitted to sharing sharp objects such as razors, needles, and scissors (45.0%). A positive finding was recorded where slightly more than half admitted that they asked

questions regarding blood screening before transfusion (50.4%), as shown in Table 5:

Table 5: Attitude of Participants about HBV N=409

Variable	Frequency (n)	Percentage (%)
Do you think you are personally at risk of contracting Hepatitis B?		
No	120	29.3
Not sure	109	26.7
Yes	131	32.0
Do you share sharp objects (razor blades, needles, clippers) with others?		
No	197	48.2
Yes	184	45.0
Do you usually ask about blood screening before transfusion (if ever received one)?		
No	92	22.5
Not applicable	77	18.8
Yes	206	50.4

In order to measure the average understanding and attitude of the respondents towards HBV, the composite scores from the total of 409 respondents were evaluated and analyzed using the methodology discussed under the materials and methods section above. The percentages of respondents with poor, average, and excellent knowledge; low, medium, and high misconceptions; and negative, neutral, and positive attitudes are presented in tables 6, 7, and 8 below, respectively.

Overall Knowledge of Respondents about HBV Infection

As depicted in Table 6, poor knowledge on HBV was observed among more than two-fifths (43.8%), fair knowledge in nearly two-fifths (37.7%), and good knowledge in less than one-fifth (18.6%) of respondents in this study.

Table 6: Overall Knowledge Grade (0–15 scale) N=409

Variable	Frequency (n)	Percentage (%)
Poor (0–7)	179	43.8
Fair (8–11)	154	37.7

Good (12–15)	76	18.6
Total	409	100.0

Overall Misconception about the Mode of HBV Infection

From Table 7, it can be observed that the level of misconceptions about the mode of HBV

infection was moderate in over two-fifths (42.8%), high in nearly one-quarter (23.5%), and low in one-third (33.7%) of respondents.

Table 7: Overall Misconception Grade (0–8 scale) N=409

Variable	Frequency (n)	Percentage (%)
Low (0–2)	138	33.7
Moderate (3–5)	175	42.8
High (6–8)	96	23.5
Total	409	100.0

Overall Attitude towards HBV Vaccination

As shown in Table 8, the attitude of participants towards HBV vaccination was found to be

positive among over half (51.1%), neutral in nearly one-third (31.5%), and negative in one-sixth (17.4%) of respondents.

Table 8: Overall Attitude Grade (5–25 scale) N=409

Variable	Frequency (n)	Percentage (%)
Negative (5–12)	71	17.4
Neutral (13–18)	129	31.5
Positive (19–25)	209	51.1
Total	409	100.0

Association between sociodemographic characteristics and overall level of knowledge of HBV

Table 9 shows that age, faculty, level of study, and marital status had significant relationships

with total knowledge about HBV ($p < 0.05$). Gender was not significantly related to knowledge level ($p = 0.845$).

Table 9: Association between sociodemographic characteristics and overall level of knowledge of HBV, N=409

Variable	Categories	Poor n (%)	Fair n (%)	Good n (%)	χ^2 (df)	p-value
Age	15-19	62 (34.6)	31 (20.1)	9 (11.8)	32.18 (6)	<0.001*
	20-24	87 (48.6)	78 (50.6)	31 (40.8)		
	25-29	22 (12.3)	35 (22.7)	23 (30.3)		
	30 and above	8 (4.5)	10 (6.5)	13 (17.1)		
Gender	Male	87 (48.6)	70 (45.5)	36 (47.4)	0.34 (2)	0.845
	Female	92 (51.4)	84 (54.5)	40 (52.6)		
Level of Study	100L-300L	124(69.3)	78(50.6)	28(36.8)	25.92 (2)	<0.001*
	400L-500L	55(30.7)	76(49.4)	48(63.2)		
Faculty	Health-related	61(34.1)	89(57.8)	53(69.7)	31.47 (2)	<0.001*
	Non-health	118(65.9)	65(42.2)	23(30.3)		
Marital Status	Single	43(79.9)	125(81.2)	51(67.1)	6.82 (2)	0.033*
	Married	36(20.1)	29(18.8)	25(32.9)		

*Significant at $p < 0.05$, df = degrees of freedom**Association between sociodemographic characteristics and overall misconceptions about HBV N=409**

From Table 10, it is evident that age, faculty, and level of education were significantly associated with misconceptions about HBV ($p < 0.05$).

Gender and marital status were not significantly associated with misconceptions level ($p > 0.05$).

Table 10: Association between sociodemographic variables and misconceptions regarding HBV, N=409

Variable	Categories	Low n (%)	Moderate n (%)	High n (%)	χ^2 (df)	p-value
Age	15-19	22(15.9)	47(26.9)	33(34.4)	19.74 (6)	0.003*
	20-24	72(52.2)	85(48.6)	39(40.6)		

	25-29	32(23.2)	33(18.9)	15(15.6)		
Gender	30 and above	12(8.7)	10(5.7)	9(9.4)		
	Male	63(45.7)	84(48.0)	46(47.9)	0.19 (2)	0.908
	Female	75(54.3)	91(52.0)	50(52.1)		
Faculty	Health-related	94(68.1)	78(44.6)	31(32.3)	31.02 (2)	<0.001*
	Non-health	44(31.9)	97(55.4)	65(67.7)		
Level of Study	100L-300L	61(44.2)	98(56.0)	71(74.0)	19.88 (2)	<0.001*
	400L-500L	77(55.8)	77(44.0)	25(26.0)		
Marital Status	Single	108(78.3)	140(80.0)	71(74.0)	1.32 (2)	0.517
	Married	30(21.7)	35(20.0)	25(26.0)		

*Significant at $p < 0.05$, df = degrees of freedom

Predictors of Good Knowledge of HBV among Respondents N=409

Table 11 shows the predictors of good knowledge of HBV using binary logistic regression. In the adjusted model, age, faculty, and level of study were significant predictors of good knowledge. Respondents aged 25–29 years [AOR = 2.48, 95% CI: 1.01–6.10, $p = 0.048$] and

those 30 years and above [AOR = 3.91, 95% CI: 1.33–11.48, $p = 0.013$] had higher odds of good knowledge compared to those aged 15–19 years. Being in a health-related faculty [AOR = 2.15, 95% CI: 1.20–3.85, $p = 0.010$] and being in 400L–500L [AOR = 1.79, 95% CI: 1.01–3.18, $p = 0.047$] were also significantly associated with good knowledge. Gender and marital status were not significant predictors in the adjusted model.

Table 11: Binary logistic regression showing predictors of good knowledge of HBV among respondents N=409

Variable	Categories	Good Knowledge n (%)	Crude OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Age	15-19	9(8.8)	1		1	
	20-24	2431(15.8)	1.94 (0.88–4.29)	0.100	1.31 (0.56–3.05)	0.532

	25-29	23(28.8)	4.17 (1.80–9.68)	0.001	2.48 (1.01–6.10)	0.0480*
	30 and above	13(41.9)	7.52 (2.78–20.36)	<0.001	3.91 (1.33–11.48)	0.013*
Gender	Male	36(18.7)	1		1	
	Female	40(18.5)	0.99 (0.60–1.63)	0.970	0.92 (0.53–1.59)	0.765
Faculty	Health-related	23(11.2)	1		1	
	Non-health	53(26.1)	2.81 (1.64–4.81)	<0.001	2.15 (1.20–3.85)	0.010*
Level of Study	100L-300L	28(12.2)	1		1	
	400L-500L	48(26.8)	2.64 (1.58–4.43)	<0.001	1.79 (1.01–3.18)	0.047*
Marital Status	Single	51(16.0)	1		1	
	Married	25(27.8)	2.02 (1.17–3.49)	0.012	1.26 (0.68–2.34)	0.467

*Significant at $p < 0.05$

Discussion

The demographic composition of undergraduates in this study was largely young, having a significant proportion of 65.3% who were 24 years old or less, while females accounted for 55.5%. This pattern of age distribution among undergraduates is common in universities in Nigeria and has been reported among participants at Ekiti State University, Nigeria, who had ages ranging from 20 to 24 years (6). Similarly, the preponderance of females is an observed trend at universities in Nigeria, where there are more female participants than males; findings that agree with

those reported by Ojo and Adebawale in their study conducted in Ekiti State in 2025 (6). Various factors could be responsible for this trend, which include national policies on girl child education, along with the nature of the institution under study, which is a faith-based private university that has more female than male applicants. The majority of participants (25.7%) were in 300L and 400L (23.7%). This shows a greater percentage of senior participants who ought to know better about health issues. Only 6.4% of participants came from the College of Health Sciences. The low participation rate among health science students is consistent with

previous studies, such as that of Elegbede et al. (15), where non-medical students were predominant, and could account for some of the knowledge deficiencies noted. The majority of the participants are single (63.3%), which is characteristic of the marital status among university students, and is also consistent with 71.1% single participants reported in a recent KAP study conducted among Jordanian health sciences students (2).

The mean knowledge on the hepatitis B virus as a virus was 53.3%, which is low compared to 80.3% noted among students in the healthcare profession in Jordan (2) and 95.5% among non-medical students in Egypt (21). The misunderstanding of the causative organism of hepatitis B as being caused by bacteria in 23.5% and “don’t know” by 23.2% shows basic misconceptions about the etiology of the hepatitis B virus. This finding supports that of Eni et al. (7), who recorded that 20.9% of youths in Nigeria correctly identified the hepatitis B virus as a virus. Although 49.4% correctly identified the effect of HBV as causing liver disease and cancer, it is below the 73.8% identified among nurses in Poland (22) and implies poor knowledge of HBV. More alarming is the very low level of knowledge on all three routes of transmission of the hepatitis B virus, which was 23.7%. The misbelief that HBV “can be totally cured by antibiotics” shared by 34.7% of participants poses a challenge because antibiotics cannot be used to treat HBV infections. Similar beliefs regarding the use of antibiotics to cure HBV were found among 31.2% of dental students in India (23), indicating that the issue may not be confined to Nigeria. One plausible cause for this deficiency could be that the majority of participants were non-health-related students (93.6%) who relied on the internet/social media for information (23.0%), which is known to lack credibility (2, 7, 10, 21, 22, 23, 44).

The highest source of HBV information was the internet/social media, accounting for 23.0%, secondly, health workers constituted 21.8%, whereas formal lectures/classroom teachings and health campaigns had the same percentage share of 13.9%. This trend differs from that of health

professional students, wherein their source is lecturers and conforms with the results obtained by Opele and Tomori (17). This is because there has been an increasing number of Nigerian students obtaining information about their health through the internet/social media channels. It is disheartening that despite the stress on awareness activities in the National Guidelines of Nigeria (4), the results obtained in this study and the one obtained by Agbesanwa et al. (10) have shown that 13.9% and 12.4%, respectively, were sourced from health campaigns. Possible factors behind this could be due to a lack of HBV activities within the university, as well as increased reliance on the internet following COVID-19. The low level of utilization of health workers (21.8%) compared to 47.2% obtained in a Kenyan university study shows an opportunity loss during regular medical examinations at the university clinics (4, 10, 17, 26).

In total, between 28.1% and 41.8% of participants subscribed to myths concerning routes of transmission, with sharing meals from the same plate being the most prevalent misconception (41.8%). It is higher than 29.4% among Turkish university students (27) but lower than 56.7% among a sample of Ghanaian university students surveyed in 2021 (27). Transmission through mosquito bites accounted for 37.9% of respondents, similar to 35.1% observed among Malaysian non-medical undergraduate students (29) and representing continued confusion regarding vector-borne transmission due to the existence of malaria vectors in Nigeria. Transmission through handshakes and hugging, and only through symptomatic individuals, both accounting for 37.9%, represent misconceptions concerning the role of asymptomatic carriers in disease epidemiology (12). Myths surrounding the mode of transmission were higher among non-health faculties and lower levels of study, as was the case reported by Alaridah et al. (2), where non-medical students were found to have higher rates of misconception (2). Possible reasons are cultural myths and a lack of sufficient microbiology in general education courses (2, 11, 27, 28, 29). Despite 78.2% awareness of the HBV vaccine, less than a fifth (17.8%) had received the vaccine fully. A disparity of 60.4%

between the knowledge of the vaccine and vaccination practice was found to be higher than 42.3%, recorded among Iranian students (31). The same level of disparity was found in a 2022 Ethiopian study, which was 59.1% (32). Although partial vaccination was more common (43.5%), this means that many individuals started but were unable to complete vaccination. Some possible reasons for non-completion included high costs since vaccination occurs privately in Nigerian universities, lack of policies, and inadequate follow-ups. Only 42.1% of the respondents showed willingness to get vaccinated, compared to 78.6% of respondents in 2023 study in Saudi Arabia (34). Perhaps the willingness rate may have been affected by social media misinformation. Although not many received the vaccine, 54.7% favored compulsory vaccination, and 68.7% agreed to advocate among their peers as found in previous studies (15, 31, 32, 34). This study found that the risk perceptions were relatively low in that only 32.0% felt at risk of infection, even in Nigeria, where the infection rates are high. The optimism bias is typical among young people and occurs among 29.8% of Chinese undergraduate students too (37). The practice of sharing sharps is relatively high at 45.0%, considering that HBV is very effective when transmitted parenterally; the percentage is also significantly higher than 28.3% recorded among Sudanese students (38). This may be a result of communal accommodation in hostels, coupled with a low sense of risk perception. It is gratifying to note that 50.4% inquired into their blood safety status prior to transfusions compared to the 34.2% found in a Cameroonian study conducted in 2021 (39).

Poor knowledge among 43.8% respondents and good knowledge among 18.6% respondents suggest inadequate HBV knowledge among the surveyed population. This suggests a worse knowledge rate compared to 31.2% among non-medical students in Egypt (21), although it is still better than 11.4% in India (41). The low knowledge despite having good awareness (78.2%) about vaccines suggests that just hearing the word does not equate to knowledge, as observed by WHO (11). The predictor factors of having good knowledge include being from a

health-related faculty, having a high level of education (400L–500L), and being above 25 years old (Table 11). This could be due to higher exposure to information through the curriculum and the development of higher cognitive processes (11, 21, 41, 54). Misconception rates ranging from moderate to high for 66.3% of the participants are a significant public health issue since misconceptions are barriers to prevention efforts. This rate is much higher compared to that of 49.1% reported among Kenyan undergraduate students (26); however, it is almost identical to the results of a recent study conducted in Pakistan, where the misconception rate was 68.4% (43). Having received education in health-related subjects and being at a higher level of education were predictors of low levels of misconception, which indicates the importance of formal education in correcting myths (Table 12). The lack of marital status as a predictor of misconception, unlike knowledge, indicates that myths have cultural bases rather than experiential bases (26, 43). With regards to attitude towards HBV vaccination, the positivity rate of 51.1% is encouraging and much higher than that of 38.7% found amongst Nepalese students (46). This is attributed to the current conversation about post-COVID-19 vaccines. It is only the faculty who had predicted a positive attitude, where those in health are 1.89 times likely to have positive attitudes, probably due to socialization with the professional environment. This implies that knowledge increases with age/level, unlike attitudes. The inconsistency between 51.1% positive attitudes and 17.8% full vaccination shows other challenges aside from the attitudinal ones, like affordability and accessibility (46).

In this study, significant association was observed between age, faculty, educational level, and marital status, which rejected the null hypothesis on these factors (Table 9). The correlation between age and knowledge shows that those aged 30+ years possessed good knowledge (41.9%) compared to those aged 15–19 years (8.8%). This relationship can be attributed to cognitive development and increased exposure and corroborates trends observed in a study conducted in Jordan (2). The health faculty had a higher proportion of good

knowledge than the non-health faculty (69.7% vs. 30.3%), which is anticipated. This finding aligns with observations by Elegbede et al. (15), indicating the influence of curriculum. Educational level significantly correlated with knowledge, as students in the 400L–500L group performed better than the 100L–300L group, suggesting inclusion of HBV themes at higher levels. Respondents who were married had better knowledge than unmarried participants (27.8% vs. 16.0%), perhaps due to antenatal screening experience. However, the association became insignificant in multivariate analysis. Gender did not correlate with knowledge, unlike in the study by Oditia et al. (9), where females had good knowledge. This disparity might be due to equal digital accessibility by all genders (2, 8, 15, 54). Similarly, age, faculty, and level were found to be significantly related to misconception in this study, which provided evidence against the null hypothesis to some extent. Students aged 15-19 accounted for the highest percentage of high misconceptions (34.4%), similar to 2024 figures in Botswana (51), and this might be attributable to the lower experience with health education. The protective role of health faculty and higher levels indicated that formal education dispelled myth. There was no significant relationship between gender and marital status, and misconception since misconceptions existed among these factors, but not knowledge. Thus, the intervention programs should address all demographics rather than males and singles only (51).

Following adjustment, the significant predictors of good knowledge found in this study included age ≥ 25 years, health-related faculty, and 400L–500L (Table 11). The odds ratio (3.91) for age 30+ was in line with the results obtained by Seto et al., who stated that age acted as an indicator of experiences in health. The odds ratio for health faculty (2.15) proved the curriculum to be the strongest factor according to WHO (11). The lack of significance of marital status indicates that this variable is a confounder of age because married students are older. This implies that gender was not a significant predictor and thus, efforts should be geared towards improving academics. The findings point out that senior health faculty students can act as peer educators

for the knowledge-practice discrepancy observed (13).

Study Limitations and Mitigation Steps

In addition to its strengths, there were some limitations with the study. The cross-sectional nature of the research prevented the determination of causation. As a result, the connections observed in the association between the variables and their effects should be considered not as cause-and-effect relationships. Future investigations might use longitudinal or experimental designs for better determination of the directionality. Another limitation involved the method of data collection. Self-administration of surveys is associated with high levels of social desirability and recall bias. This issue was overcome in this study through the use of anonymous questionnaires, neutral wording, and the lack of any identifiers. Furthermore, the investigation was conducted within one faith-based private university, with only 6.4% of participants from the College of Health Sciences, making the results not applicable to all Nigerian students or public institutions. Future research should ensure representative samples by stratifying them on the basis of faculty type. The vaccination status was also assessed using self-reporting without confirmation via records. Future research can address this issue via a record review of immunization cards. Finally, the quantitative approach failed to examine underlying reasons for being hesitant about getting vaccinated or having high levels of misconceptions; mixed-methods designs with focus groups were not incorporated due to the scope limitations of this survey.

Suggestions for Further Studies

Future investigations should be designed based on a multi-university approach involving public and private institutions located in various geopolitical regions of Nigeria for the sake of generalizability of results and comparison of regional peculiarities of knowledge and practice of HBV preventive measures among undergraduates. Interventional investigations will help reveal whether peer education,

subsidization of on-campus vaccination, and mobile alerts may help increase compliance with full courses of vaccination among undergraduates who have not completed the full dose of the vaccine yet. Moreover, qualitative investigations are needed to clarify cultural factors that contribute to misinformation about easy transmission of HBV among young adults and reasons why some undergraduates do not want to be vaccinated. The combination of seroprevalence study and KAP analysis will make it possible to determine the prevalence of HBV among undergraduate students. Additionally, evaluations will clarify the effects of inclusion of HBV-related information in General Studies curriculum.

Conclusion

This study has demonstrated that there was insufficient knowledge about the mode of HBV transmission among undergraduates of Al-Hikmah University, Ilorin, where 43.8% exhibited poor knowledge, and just 18.6% had good knowledge, even though more than three-quarters of them had knowledge about the HBV vaccine. There were significant variations in the level of knowledge based on the sociodemographic factors, such as being ≥ 25 years old, being enrolled in a health-related faculty, and having a senior academic level (400L–500L), which were independent predictors of good knowledge, whereas gender and marital status were non-predictors. Many misconceptions about HBV transmission existed, with 28.1% to 41.8% of the participants believing wrong modes like mosquito bite, eating from the same plate, and physical touch as the means of transmission, with 66.3% of them recording moderate to high levels of misconception. The level of misconception was related significantly to age, faculty, and level of study, thus rejecting the null hypotheses of no relationship. Though the participants had positive attitudes towards HBV vaccination, where 51.1% had positive attitudes and 54.7% favored compulsory vaccination of the students, their preventive behaviors were poor, with only 17.8% vaccinated completely against HBV and 45.0% sharers of sharp objects. The findings

therefore indicate that despite the high level of awareness about the existence of the HBV vaccine, there is still low knowledge and misconceptions about the mode of transmission, and there are no adequate preventive behaviors adopted by this population of university students.

Recommendations

To mitigate the poor knowledge and many misunderstandings identified, there is a need for structured HBV education in the General Studies curriculum among all faculties. Specifically, there should be an education programme on the transmission modes, asymptomatic nature of carriage, and ineffectiveness of antibiotic treatment. This will be useful in overcoming the challenges identified in 100L–300L students and those from non-health disciplines. To reduce the 60.4% gap between knowledge of vaccines and complete dose administration, a subsidized HBV vaccination campaign should be conducted at the university campus. There should also be follow-ups for the administration of the second and third doses to target the 43.5% with partial vaccination and the 38.9% not vaccinated. Health promotion should be peer-led through the engagement of health faculty senior students as advocates of the vaccination campaign, given their positive attitude towards encouraging others, especially friends, to seek the vaccine (68.7%). Health campaigns should also dispel the common misconceptions regarding mosquitoes, shared food, and close contact through culturally appropriate messages, as these were common across different age groups and genders. Finally, the university could adopt a policy that makes HBV testing and vaccinations a mandatory requirement for admission through pre-matriculation health education, aimed at addressing the dangerous practice of sharing sharp objects, which was observed in almost half of the participants, consistent with WHO guidelines for areas of high-endemicity.

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Authors Contributions

Conception and design of the study, as well as supervision of data acquisition and revisions to the paper, were done by Y.F.I. Contribution to design and analysis of data, as well as preparation of the draft for the paper, was done by O.R.M and S.B.S. Literature review and data analysis and interpretation were contributions of Y.F.I, M.A.J. and A.O.T. Data acquisition and manuscript preparation were contributions of A.O.A., A.D.O. and O.R.M. All the authors participated in data analysis and manuscript preparation. All the authors approved the final version of the manuscript and agreed on its publication.

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Conflict of Interest

The authors declare that there is no conflict of interest.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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