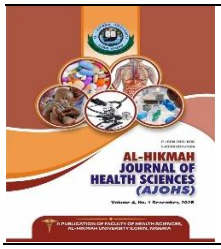
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Original Article

Knowledge, Attitude, and Practice towards Hepatitis B Infection and Vaccination among Undergraduate Students of Al-Hikmah University, Ilorin, Nigeria

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ABSTRACT

Background: Hepatitis B virus (HBV) infection is a major public health problem worldwide. This study assessed knowledge, attitude and practice (KAP) towards hepatitis B virus (HBV) infection and vaccination among undergraduate students of Al-Hikmah University, Ilorin, Nigeria.

Methodology: A descriptive cross-sectional survey of 426 undergraduates, selected by multistage sampling across all faculties, used a structured self-administered questionnaire. Data were analysed using descriptive statistics and chi-square tests ($\alpha = 0.05$).

Results: Knowledge was good overall (grand mean = 0.70; 70.1% correct), best for the viral cause (84.5%) and weakest for sexual transmission (56.1%). Attitude towards vaccination was positive (grand mean = 2.76/4.00), although cost (58.5%) and fear of side effects (69.5%) were cited as barriers. Preventive practice was adequate (3.08/4.00), but screening (2.78) lagged behind avoiding shared sharps (3.67). Knowledge ($\chi^2(1) = 10.56$, $p = .001$) and attitude ($\chi^2(1) = 13.87$, $p < .001$) were each associated with practice.

Conclusion: Knowledge, attitude and practice were generally favourable, but gaps in knowledge of sexual transmission, cost and safety concerns, and low screening uptake persist. Targeted health education on transmission and improved access to vaccination and screening are recommended.

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Introduction

Hepatitis B virus (HBV) infection is a major public health problem worldwide, with an estimated 254 million people living with chronic infection and 1.1 million deaths in 2022, mostly from cirrhosis and hepatocellular carcinoma (World Health Organization, 2024). Nigeria is highly endemic, with a national pooled prevalence of 9.5% (Elegbede *et al.*, 2022).

A safe and effective vaccine is the most effective way to prevent HBV infection (World Health Organization, 2024), but its impact depends on the knowledge, attitudes and practices of target populations, which the knowledge, attitude and practice (KAP) framework is widely used to measure (Glanz *et al.,* 2015). University students merit attention because of their growing autonomy over health decisions and potential exposure to behavioural risks, and vaccine uptake is low: only 26.9% of non-medical undergraduates in a private university in Ekiti State had received any dose (Elegbede et al., 2022), and 10.4% of undergraduates

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surveyed at Al-Hikmah University had received at least one dose (Abdulazeez, 2026).

Evidence on HBV knowledge among Nigerian students is mixed. Good knowledge of the HBV vaccine was found in 77.6% of non-medical undergraduates in Ekiti State (Elegbede *et al.*, 2022) and good knowledge of HBV in 65.2% of Al-Hikmah undergraduates (Abdulazeez, 2026), whereas overall knowledge was 65.7% among medical students at the University of Benin, where poor awareness and high vaccine cost discouraged uptake (Omuemu et al., 2009). Medical students in North Sudan had good knowledge and favourable attitudes, yet only 33.0% were vaccinated (Mohamed et al., 2025).

Such gaps between favourable attitudes and preventive action are consistent with Sheeran's (2002) account of the intention–behaviour gap, in which situational and structural factors such as cost and fear of side effects prevent favourable intentions from becoming action. Babiker *et al.* (2025) also assessed KAP towards HBV among medical students in Sudan. At Al-Hikmah University, a private faith-based institution with health-related and non-health-related faculties and a campus health service without a formal HBV vaccination programme, only one earlier study of knowledge and perception of vaccination has been reported (Abdulazeez, 2026). No study has examined knowledge, attitude and practice together or their associations, which limits tailored health education and vaccination access.

This study therefore evaluated the knowledge, attitude and practice of undergraduate students of Al-Hikmah University, Ilorin, towards HBV infection and vaccination, with the objectives to determine the level of knowledge of HBV infection (transmission, risk factors, complications and prevention); to assess attitude towards HBV infection and vaccination (susceptibility, severity and vaccine safety); and to evaluate practice in preventing HBV infection (vaccination uptake, screening and avoidance of high-risk behaviour).

Research Methodology

Research Design

A descriptive cross-sectional design was used, which collects data from a defined population at one point in time and allows several variables to be assessed together (Hulley *et al.*, 2013).

Population of the Study

The population comprised all registered undergraduate students of Al-Hikmah University, Ilorin, in all faculties for the 2025/2026 academic year, about 4,000 students.

Sample Size Determination and Sampling Techniques

The minimum sample size was calculated using Cochran's (1977) formula for proportions, giving 384 at a 95% confidence level (Z = 1.96), an assumed proportion of 0.50 (which maximises the sample size where no local prevalence estimate exists) and a 5% margin of error. Adding 10% for incomplete responses gave about 422 questionnaires, and 426 completed questionnaires were returned and analysed. A multistage procedure was used. In the first stage, all faculties were included because of their small number. In the second, three departments were selected from each faculty by simple random sampling (balloting without replacement). In the third, eligible students in each selected department were stratified by level of study and sampled by systematic random sampling, with the sampling interval for each stratum obtained by dividing the number of students in the stratum by the number to be sampled.

Research Instrument

The structured, self-administered questionnaire was developed from published HBV KAP studies and World Health Organization and Centers for Disease Control and Prevention guidance, and had four sections: (1) socio-demographic characteristics; (2) knowledge of HBV infection and vaccination (five items scored 1 for correct and 0 for incorrect or 'don't know'); (3) attitude towards HBV and vaccination (five four-point Likert items); and (4) practice related to HBV prevention (five four-point items on risk-avoidance, screening and health education).

Validity of the Instrument

Content validity was established by three experts in public health, epidemiology and hepatology, who rated each item for relevance, representativeness and appropriateness. Items with an item-level Content Validity Index (I-CVI) of at least 0.78 were retained (Polit & Beck, 2006); with three experts, this required unanimous agreement (I-CVI = 1.00). Face validity was checked with five undergraduates, and changes were made before piloting.

Reliability of the Instrument

The questionnaire was pre-tested on 40 undergraduates of a similar private university in Kwara State who were not in the main study. Internal consistency of the knowledge and attitude subscales was assessed with Cronbach's alpha, with ≥ 0.70 accepted (Nunnally & Bernstein, 1994), and unreliable items were modified before data collection.

Method of Data Analysis

Data were double-entered into a password-protected database and analysed using SPSS version 25.0. Frequencies, percentages, means and standard

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deviations described the respondents and answered the research questions. Knowledge scores (0–5) were classed as good (≥ 70% correct, i.e., ≥ 4 of 5 items), fair (50–69%) or poor (< 50%); for the Chi-square test, high knowledge was defined as Chi-square calculated value above table value (P-value less than 0.05). Attitude and practice items were scored 1–4; attitude was classed as positive and practice as adequate when the mean item score was at least 60% of the maximum (≥ 2.40, i.e., a total of ≥ 12 of 20), and as negative or inadequate otherwise. The two negatively worded attitude items (fear of side effects; cost) were reverse-scored (Strongly Agree = 1, Agree = 2, Disagree = 3, Strongly Disagree = 4, i.e., score = 5 minus the original score) so that higher scores always indicate a more favourable attitude. Table 3 reports these reverse-scored means, and the grand mean is the average of the five item means. The null hypotheses were tested with Pearson's chi-square test of independence with Yates' continuity correction for 2 × 2 tables, at a 0.05 significance level, with odds ratios and 95% confidence intervals as effect sizes.

Ethical Consideration

The study followed the Declaration of Helsinki (World Medical Association, 2013). Ethical approval was obtained from the Kwara State Ministry of Health Research Ethics Committee with approval date from 29/09/2026 to 28/09/2027 (Ref. Number: ERC/MOH/2026/09/881) before data collection began. All participants gave written informed consent after reading an information sheet on the purpose, procedures, risks, benefits, confidentiality and right to withdraw without consequence, and parental or guardian consent was obtained for participants under 18 years. Questionnaires contained no identifying information, and data were stored in a password-protected database accessible only to the research team.

Results

Demographic Characteristics of Respondents

Table 1: Demographic Characteristics of Respondents (N = 426)

Variable	Category	Frequency (%)
Age (years)	≤19	36 (8.5%)
	20-24	240 (56.3%)
	25-29	97 (22.8%)
	30 and above	48 (11.3%)
	Missing	5 (1.2%)
Sex	Male	225 (52.8%)
	Female	201 (47.2%)
Level of Study	100 Level	74 (17.4%)
	200 Level	101 (23.7%)
	300 Level	128 (30.0%)
	400 Level	99 (23.2%)
	500 Level	24 (5.6%)
Faculty/Discipline Group	Social and Management Sciences	149 (35.0%)
	Pure and Applied Sciences	129 (30.3%)
	Education	67 (15.7%)
	Basic Medical Sciences (Health-related)	38 (8.9%)
	Arts and Islamic Studies	25 (5.9%)
	Law	14 (3.3%)
	Missing	4 (0.9%)
Discipline Type	Health-related	38 (8.9%)
	Non-health-related	384 (90.1%)
	Missing	4 (0.9%)

Table 1 shows that the 426 respondents were aged 17–54 years, with 56.3% aged 20–24 years. Males (52.8%) slightly outnumbered females (47.2%), 30.0% were in 300 Level, and respondents came mainly from Social and Management Sciences (35.0%) and Pure and Applied Sciences (30.3%), with 8.9% in health-related disciplines.

Research Question One: What is the level of knowledge of hepatitis B virus infection among undergraduate students of Al-Hikmah University, Ilorin?

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Table 2: Descriptive Statistics of Knowledge of Hepatitis B Virus Infection and Vaccination

Item	Yes (Correct)	No (Incorrect)	Mean	S.D.
Hepatitis B is caused by a virus.	360 (84.5%)	66 (15.5%)	0.85	0.36
Hepatitis B can be transmitted through unprotected sexual intercourse.	239 (56.1%)	187 (43.9%)	0.56	0.50
Sharing of needles or syringes can spread Hepatitis B virus (HBV).	308 (72.3%)	118 (27.7%)	0.72	0.45
A safe and effective vaccine exists that can prevent Hepatitis B infection.	271 (63.6%)	155 (36.4%)	0.64	0.48
Chronic Hepatitis B infection can lead to liver cirrhosis or liver cancer.	315 (73.9%)	111 (26.1%)	0.74	0.44
Grand Mean			**0.70**	

Note. *Knowledge categorised as good ≥ 70%, fair 50–69% and poor < 50% of correct responses; S.D. = standard deviation.*

Table 2 shows a grand mean of 0.70 (70.1%), indicating good overall knowledge in line with the ≥ 70% threshold. Knowledge was strongest for the viral cause of hepatitis B (84.5% correct) and for cirrhosis and liver cancer as complications of chronic infection (73.9%), and weakest for sexual transmission (56.1%) and the existence of a safe and effective vaccine (63.6%).

Research Question Two: What are the attitude of undergraduate students towards hepatitis B virus infection and hepatitis B vaccination?

Table 3: Descriptive Statistics of Attitude towards Hepatitis B Vaccination

Item	SA	A	D	SD	Mean	S.D.
I believe the Hepatitis B vaccine is effective in preventing Hepatitis B infection.	286 (67.1%)	103 (24.2%)	24 (5.6%)	13 (3.1%)	3.55	0.74
Fear of side effects discourages me from receiving the Hepatitis B vaccine. (reverse-scored)	118 (27.7%)	178 (41.8%)	116 (27.2%)	14 (3.3%)	2.06	0.82
The cost of the Hepatitis B vaccine is a barrier to getting vaccinated. (reverse-scored)	113 (26.5%)	136 (31.9%)	141 (33.1%)	36 (8.5%)	2.23	0.94
I intend to complete the full recommended Hepatitis B vaccine doses (3 doses) if not already done.	133 (31.2%)	156 (36.6%)	72 (16.9%)	65 (15.3%)	2.84	1.03
My religious or cultural beliefs do not prevent me from receiving the Hepatitis B vaccine.	178 (41.8%)	153 (35.9%)	51 (12.0%)	44 (10.3%)	3.09	0.97
Grand Mean					**2.76**	

Note. *SA = Strongly Agree (4), A = Agree (3), D = Disagree (2), SD = Strongly Disagree (1); S.D. = standard deviation. Fear of side effects and cost are reverse-scored (score = 5 minus original score), so means shown are reverse-scored; for the grand mean, (3.55 + 2.06 + 2.23 + 2.84 + 3.09)/5 = 2.76. Positive attitude = mean ≥ 60% of maximum (2.40). Counts and percentages are the original responses.*

Table 3 shows a grand mean of 2.76 out of 4.00, above the positive-attitude threshold of 2.40, indicating a positive overall attitude. Belief in vaccine effectiveness was most strongly endorsed (mean = 3.55; 91.3% agreeing), followed by the view that religious or cultural beliefs do not prevent vaccination (3.09). The reverse-scored barrier items had the lowest means, for cost (2.23) and fear of side effects (2.06): on the original responses, 58.5% agreed that cost is a barrier and 69.5% that fear of side effects discourages vaccination, so these barriers persist despite the positive overall attitude.

Research Question Three: What preventive practice do undergraduate students engage in with respect to HBV infection and vaccination?

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Table 4: Descriptive Statistics of Preventive Practice Related to Hepatitis B Infection

Item	Always	Often	Rarely	Never	Mean	SD
I avoid sharing sharp objects (e.g., razors, clippers, needles) with others.	313 (73.5%)	92 (21.6%)	13 (3.1%)	8 (1.9%)	3.67	0.63
I use a condom during sexual intercourse to protect against blood-borne infections.	146 (34.3%)	185 (43.4%)	65 (15.3%)	30 (7.0%)	3.05	0.88
I participate in health education activities or awareness programmes on Hepatitis B.	118 (27.7%)	148 (34.7%)	119 (27.9%)	41 (9.6%)	2.81	0.95
I seek medical screening or testing for Hepatitis B at a health facility.	147 (34.5%)	121 (28.4%)	74 (17.4%)	84 (19.7%)	2.78	1.12
I avoid contact with another person's blood or body fluids without wearing protective gloves.	185 (43.4%)	130 (30.5%)	79 (18.5%)	32 (7.5%)	3.10	0.96
Grand Mean					**3.08**	

Note. *Practice adequacy threshold set at ≥ 60% of maximum score (2.40); S.D. = standard deviation.*

Table 4 shows a grand mean of 3.08 out of 4.00, above the adequacy threshold of 2.40, indicating adequate preventive practice overall. Avoiding shared sharp objects was most consistently practised (mean = 3.67; 95.1% always or often), while participation in HBV health education (2.81) and seeking screening or testing (2.78, the widest variability, S.D. = 1.12) were least practised, so active health-seeking lags behind passive risk avoidance.

Hypotheses Testing

H_{01}: There is no significant association between the level of knowledge of hepatitis B virus infection and hepatitis B preventive practice among undergraduate students of Al-Hikmah University.

Table 5: Chi-Square Test of Association between Knowledge Level and Practice Level

Knowledge Level	Adequate Practice	Inadequate Practice	Total	χ^2
High Knowledge	194 (95.1%)	10 (4.9%)	204	
Low Knowledge	189 (85.1%)	33 (14.9%)	222	
Total	383 (89.9%)	43 (10.1%)	426	10.56

Note. *$\chi^2(1) = 10.56$, $p = .001$ (Yates' continuity correction; uncorrected Pearson $\chi^2(1) = 11.63$, $p < .001$); $\varphi = 0.17$. Critical value $\chi^2(1) = 3.841$ at $p = .05$.*

Table 5 shows $\chi^2(1) = 10.56$, greater than the critical value of 3.841 ($p = .001$). Adequate practice was found in 95.1% of students with high knowledge and 85.1% of those with low knowledge (odds ratio = 3.39, 95% CI 1.62–7.07). The null hypothesis is rejected: knowledge level is significantly associated with preventive practice.

H_{02}: There is no significant association between attitude towards hepatitis B virus infection and hepatitis B preventive practice among undergraduate students of Al-Hikmah University.

Table 6: Chi-Square Test of Association between Attitude Level and Practice Level

Attitude Level	Adequate Practice	Inadequate Practice	Total	χ^2
Positive Attitude	346 (92.0%)	30 (8.0%)	376	
Negative Attitude	37 (74.0%)	13 (26.0%)	50	
Total	383 (89.9%)	43 (10.1%)	426	13.87

Note. *$\chi^2(1) = 13.87$, $p < .001$ (Yates' continuity correction; uncorrected Pearson $\chi^2(1) = 15.79$, $p < .001$); $\varphi = 0.19$. Critical value $\chi^2(1) = 3.841$ at $p = .05$.*

Table 6 shows $\chi^2(1) = 13.87$ ($p < .001$), greater than the critical value of 3.841. Adequate practice was found in 92.0% of students with a positive attitude and 74.0% of those with a negative attitude (odds ratio = 4.05, 95% CI 1.95–8.44). The null hypothesis is rejected: attitude is significantly associated with preventive practice.

Discussion

Knowledge of Hepatitis B Virus Infection

The grand mean for knowledge (70.1%) indicates good overall knowledge, which is consistent with good knowledge reported among non-medical undergraduates in Ekiti State (77.6%; Elegbede et al., 2022) and above the 65.2% reported for Al-Hikmah undergraduates (Abdulazeez, 2026) and the 65.7% for University of Benin medical students (Omuemu et al., 2009). Knowledge was best for the viral cause (84.5%)

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and chronic complications (73.9%), suggesting that basic disease awareness has reached students, and weakest for sexual transmission (56.1%), which may reflect reluctance to discuss sexual topics openly in a faith-based university, although this explanation was not tested.

Attitude towards Hepatitis B Vaccination

Attitude towards vaccination was positive overall, and belief in vaccine effectiveness was the most strongly endorsed item (3.55; 91.3% agreeing). The lower means for cost (2.23; 58.5% agreeing it is a barrier) and fear of side effects (2.06; 69.5%) show that economic and safety concerns persist. High vaccine cost and poor awareness were also found to discourage uptake among medical students at the University of Benin (Omuemu et al., 2009), and good knowledge and favourable attitudes coexisted with low vaccination coverage (33.0%) among North Sudan medical students (Mohamed et al., 2025). Sheeran's (2002) account of the intention–behaviour gap offers an explanation: situational and structural factors such as cost and perceived risks stand between favourable attitudes and action.

Preventive Practice and Their Association with Knowledge and Attitude

Practice was adequate overall, but passive risk avoidance exceeded active health-seeking: avoiding shared sharps was most consistent (3.67; 95.1% always or often), whereas screening (2.78) and participation in health education (2.81) were lowest. Knowledge and attitude were each significantly associated with practice, in line with the KAP framework (Glanz *et al.*, 2015) and with the association between good knowledge and vaccine uptake reported by Elegbede *et al.* (2022). However, Abdulazeez (2026) found no association between knowledge and vaccine uptake at the same university, so the association may depend on how practice is measured. Because the design is cross-sectional and the analyses unadjusted, these are associations, not evidence that knowledge or attitude cause better practice.

Conclusion

Undergraduates of Al-Hikmah University have good overall knowledge of HBV, but knowledge of sexual transmission is relatively low despite the high behavioural risk of this age group. Attitude towards vaccination is positive, but cost and fear of side effects persist as barriers. Preventive practice is adequate overall, with passive risk avoidance more common than active health-seeking such as screening and participation in health education. Knowledge and attitude were each significantly associated with practice, which supports the KAP framework in this population.

Recommendations

The following recommendations are made on the basis of the results:

1. The Department of Community Medicine and Public Health, with student health services, should provide structured HBV health education for students in non-health-related faculties, stressing transmission routes, particularly sexual transmission.
2. A basic module on vaccine-preventable diseases, with emphasis on hepatitis B, should be added to the general studies or orientation course for all incoming students.
3. University health services, with the Kwara State Ministry of Health, should consider free or subsidised HBV vaccination for undergraduates to remove cost as a barrier to uptake.
4. Campus health services should promote and facilitate HBV screening on campus, since active health-seeking behaviours were less common than passive ones.

Limitations of the Study

This cross-sectional study cannot show causal relationships between knowledge, attitude and practice, and the chi-square analyses were unadjusted for confounders such as faculty, level of study and sex. Dichotomising scores loses information, and the results depend on the cut-offs used. Data were self-reported and may be affected by social-desirability bias, especially for sexual behaviour, and by recall bias for vaccination history. The study covered one private university in Ilorin, so the findings cannot be generalised to other universities or settings.

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