# The hepatitis B virus: Attitude, perception and willingness to undergo vaccination among undergraduates in health-related courses in a tertiary institution, Lagos, Nigeria

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**Abstract**

Hepatitis B virus (HBV), an infectious disease of global significance, causes a significant health burden particularly in Africa. Medical and paramedical undergraduates are at increased risk of HBV exposure due to their academic and clinical responsibilities. Attitudes, perceptions and willingness to receive vaccination are determinants of protection and disease transmission.

A descriptive cross-sectional study was conducted among medical and paramedical undergraduates using a structured, self-administered questionnaire. Data collected included socio-demographic characteristics, knowledge and perception of HBV, attitudes toward vaccination, and willingness to receive HBV vaccine. Data were analyzed using descriptive and inferential statistics. Level of statistical significance was set at p value <0.05. Of 277 consecutively recruited respondents, 18.8%, 24.5% and 13.7% were medical, medical laboratory science and nursing students respectively while 43.0% were pharmacy students. A total of 62.5% of the respondents strongly agreed that Hepatitis B poses a significant occupational hazard for medical and paramedical students, and 64.6% showed a positive attitude towards Hepatitis B and vaccination. More than three-quarters, 78.7% expressed their willingness to be vaccinated. Of these, 72.9% were very likely to recommend it to their peers. Positive attitude and willingness to be vaccinated was significantly associated with gender (p=0.001 & 0.030) and faculty of study (p=0.016 & < 0.001) respectively.

The study demonstrated positive attitudes towards both Hepatitis B and vaccination

among respondents. Willingness to vaccinate appears promising but hindered by logistic and financial constraints. Targeted health education, discounted vaccination programs, and curriculum integration are recommended to promote vaccine uptake among undergraduates in Nigerian universities.

**Keywords:** Hepatitis B, Vaccination, Attitudes, Undergraduates, Willingness, Lagos.

## Introduction

Hepatitis B, a viral infection caused by the Hepatitis B virus (HBV), is a significant global health issue. It is a leading cause of acute and chronic liver disease, including cirrhosis and hepatocellular carcinoma (WHO, 2024). Over two billion people globally have been exposed to HBV, and over 300 million individuals have been identified as chronic carriers (Liu *et al*., 2023). HBV infection is more prevalent in low-income countries, particularly in Africa (Zampino *et al*., 2015). Sub-Saharan Africa, including Nigeria, bears a high burden of this disease due to its endemic nature, socio-economic challenges, and healthcare disparities, and has the second largest number of chronic carriers. Nigeria ranks among the countries with the highest prevalence of Hepatitis B with a reported pooled prevalence of 9.5% (Ajuwon *et al*., 2010; Hwang & Cheung 2011).

The virus is highly infectious and its primary mode of transmission includes exposure to infected blood or body fluids through practices such as unsafe injections, unprotected sex, and vertical transmission during childbirth (Inoue & Tanaka, 2016). In addition, cultural practices such as scarification, the use of unsterilized instruments, and communal lifestyles further exacerbate transmission rates. Thus, HBV poses a significant threat to people, particularly healthcare workers and students in a medical college who are at increased risk of occupational exposure (Adekanle *et al*., 2015; Hebo, Gemeda & Abdusemed, 2019; Tesfa *et al*., 2021).

The role of vaccination as a preventive strategy against hepatitis B cannot be overemphasized, being one of the most effective strategies for preventing infections and its associated complications. Vaccination not only provides immunity but also reduces the overall prevalence of HBV by interrupting transmission pathways (Mast *et al*., 2005). Undergraduates in medical and allied medical faculties represent a critical population in this regard for protection, given their increased exposure to healthcare settings and potential roles as healthcare providers. As part of safety measures, the World Health Organization (WHO) recommends that all healthcare workers be

vaccinated against hepatitis infection (WHO, 2022), and Nigeria has integrated the Hepatitis B vaccine into its routine immunization schedule for infants (FMOH, 2016). However, despite the availability and the efficacy of the vaccine, vaccination uptake among young adults, particularly undergraduate university students, remain inadequate (Chingle *et al*., 2017). Studies have revealed a substantial gap in vaccination among this population, often as a result of several factors such as lack of awareness of HBV, fears of side effects or mistrust of government healthcare programs, financial constraints, vaccine misconceptions and poor risk perceptions (Adekanle *et al*., 2015; Machmud *et al*., 2021). These studies also highlighted the importance of understanding attitudes and perceptions toward Hepatitis B and vaccination to address barriers to uptake.

Attitudes are shaped by knowledge, perceived risk, cultural influences, and accessibility to healthcare services. Understanding the attitude and perception of medical and paramedical undergraduates toward hepatitis B, as well as their willingness to undergo vaccination, is crucial as these groups are potential future physicians and healthcare leaders (Alaridah *et al*., 2024), are at higher occupational risk of infection, and will play pivotal roles in advocating for and implementing public health measures for designing targeted interventions aimed at improving vaccine uptake and preventing HBV transmission within campuses and healthcare settings.

This study, therefore, aims to assess the attitude and perception towards hepatitis B and the willingness to receive the HBV vaccine among medical and paramedical undergraduate students in the study population. The findings will provide insights into the socio-demographic factors influencing vaccination, contribute to a better understanding of behavioral determinants of vaccine uptake among this demographic, and support the development of effective health education to inform curriculum development and policy formulation to ensure that future healthcare professionals in academic institutions are adequately protected.

## Methods

### Study setting

The study was conducted at the College of Medicine campus of the University of Lagos. University of Lagos is located in the Akoka area of Lagos State, South-West Nigeria. It was established in the year 1962. University of Lagos is one of Nigeria's premier institutions of higher learning, and boasts of a diverse demography of undergraduate students enrolled in various disciplines. The College of Medicine

campus which is located in Idi-Araba comprises of students enrolled in medical, dental and pharmacy courses as well as students in other allied medical courses.

**Study design**

A descriptive cross-sectional study was conducted between June and August, 2024. Data were collected by administering a well-structured self-administered questionnaire to the sample population of students who were consecutively recruited via an online survey link, linked to Google Forms.

**Study Population and Sample Size Determination**

The study population included penultimate and final year Medical, Nursing and Medical Laboratory Science, as well as Pharmacy students enrolled in the College of Medicine and the Faculty of Pharmacy of the University of Lagos respectively. This comprised 400level and 500level students for a five-year course of study, and 500level and 600level students for a six-year course of study. However, for the purpose of this study, 300l Nursing students were enrolled because 400l Nursing students were not available.

Sample size was calculated using Yamane's formula:

$n = N/(1+N(e)^{2.}$

Where n = the study sample size

N = the population of the study = 640

e = the margin error = 0.05

n = 246.15

with 10% attrition rate, the final sample size calculated was 271 students.

**Eligibility criteria**

Students who are currently enrolled as penultimate and final year Medical, Pharmacy, Nursing and Medical Laboratory Science undergraduate students at the College of Medicine and the Faculty of Pharmacy, University of Lagos, were included in the study. Students stated in the above category who were not willing to give informed consent were excluded from the study.

**Study procedure**

A well-structured, self- administered, pre-tested questionnaire was developed based on extant literature (Adekanle *et al*., 2015; Chingle *et al.*, 2017; Aroke *et al.*, 2018), and employed to access the attitude and perception of respondents towards Hepatitis B, and their willingness to undergo Hepatitis B vaccination. The questionnaire was subjected to face and content validity by the researchers after which it was pretested among 10 students in each of the departments and faculties of study. Necessary adjustments were then made for clarity and understanding. Calculated Cronbach alpha value was

0.733. The questionnaire comprised of 44 items categorized into five sections. Section A assessed the demographic characteristics of the respondents such as age, gender, department and course of study. Section B and C assessed respondents' knowledge and perceptions to Hepatitis B infection, while section D and E assessed respondents' attitude to Hepatitis B and Hepatitis B vaccination, and their willingness to take the vaccine. Responses to the questions about knowledge were measured with a yes, no or not certain while responses to attitude and perception questions were measured using a Five-point Likert scale, ranging 1–5 from strongly agree to strongly disagree.

Each correct answer in sections on knowledge received a one point, while incorrect response received a zero score. The attitude and perception sections were assessed by adding ten questions with a possible score ranging from 10–50. Overall, knowledge and attitude levels were rated as high if they were between 80 and 100%; moderate if they were between 60 and 79% and poor if they were less than 60%.

**Ethical considerations**

Ethical approval was obtained from the Health Research Ethics Committee of the Lagos University Teaching Hospital (LUTH), Idi-Araba, Lagos, Nigeria, with Assigned Number: ADM/DSCST/HREC/APP/6683. Informed consent was obtained from the respondents and the questionnaires were coded for anonymity to assure confidentiality.

**Data analysis**

The data obtained were initially transferred to Microsoft Excel 365 for cleaning and coding. It was then further analyzed and summarized with SPSS Version 26.0, using descriptive and inferential statistics. Categorical data were summarized using frequencies and percentages, while continuous variables were summarized with Mean ± Standard Deviation (SD). Chi-square was used to determine the associations between categorical variables. Statistical significance was inferred at $p < 0.05$.

**Results**

**Socio-demographics of respondents**

The socio-demographic characteristics of the respondents in this study are shown in Table 1. The mean age of the participants was 23.45 (± 2.08 SD) years. Majority, 215 (90.6%) were aged between 20 to 25 years, and female 142 (51.3%). In terms of year of study, most respondents were in their 400 level, 114 (41.2%) and 500 level, 107, (38.6%) respectively. The largest proportion of respondents are pharmacy students, 119 (43.0%), followed by medical

laboratory science students, 68 (24.5%) and medical students, 52, (18.8%).

**Table 1: Socio-demographics of respondents**

| Variable | | Frequency (n) | Percent (%) |
|---|---|---|---|
| Age (In years) | <20 | 2 | 0.7 |
| | 20 – 25 | 251 | 90.6 |
| | 26 – 30 | 20 | 7.2 |
| | >30 | 4 | 1.4 |
| Mean ± SD = 23.45 ± 2.08 | | | |
| Gender | Female | 142 | 51.3 |
| | Male | 135 | 48.7 |
| Ethnicity | Hausa | 4 | 1.4 |
| | Igbo | 39 | 14.1 |
| | Yoruba | 206 | 74.4 |
| | Others | 28 | 10.1 |
| Religion | Agnostic | 1 | 0.4 |
| | Atheist | 2 | 0.7 |
| | Christianity | 211 | 76.2 |
| | Islam | 63 | 22.7 |
| Marital status | Married | 5 | 1.8 |
| | Single | 272 | 98.2 |
| Current level in area of study | 300L | 38 | 13.7 |
| | 400L | 114 | 41.2 |
| | 500L | 107 | 38.6 |
| | 600L | 18 | 6.5 |
| Course of study | Medicine and Surgery | 52 | 18.8 |
| | Medical Laboratory Science | 68 | 24.5 |
| | Nursing | 38 | 13.7 |
| | Pharmacy | 119 | 43.0 |

**Knowledge of respondents on Hepatitis B**

Table 2 shows the personal experiences of the respondents on Hepatitis B. Almost all, 275 (99.3%) acknowledged that Hepatitis B is a viral infection affecting the liver. The top three reported routes of transmission were through sharing needles or syringes, 263 (94.9%), sexual contact, 255 (92.1%) and semen or blood from an infected person 238 (85.9%). Only four respondents (1.4%) had ever been infected with the virus, but a notable percentage, 50 (18.1%) know someone in their immediate social environment who had been infected. Regarding the vaccination status, 149 (53.8%) of the students were vaccinated while 3 (1,1%) were not sure they were vaccinated. Lack of time was the major reason given for not being tested and/or vaccinated (n =75, 60%) among those who

were not. In terms of training, 109 (39.4%) of respondents acknowledged that their curriculum covered the risks and prevention strategies for Hepatitis B.

Awareness of key symptoms like jaundice (89.5%) and nausea (84.5%) among respondents were high, but there was confusion about unrelated symptoms like bloated belly (63.2%) and shortness of breath (73.3%). While most respondents correctly dismissed misconceptions about only the elderly being at risk of infection (250, 90.3%), only 82 (29.6%) respondents were

aware of effective treatment for Hepatitis B.

Vaccine knowledge was strong regarding its three-dose schedule, 193 (69.7%) and intramuscular administration, 268 (96.8%), but many were unclear about when full immunity is achieved, with only 122 (44.0%) knowing it's after the third dose.

The prevalence of good knowledge about Hepatitis B among study respondents was 62.5% while the prevalence of poor knowledge was 17.3%.

**Table 2: Respondent's knowledge of Hepatitis B**

| Variable | No (%) | Not certain (%) | Yes n (%) |
|---|---|---|---|
| Hepatitis B is a viral infection that affects the liver, caused by the Hepatitis B virus (HBV)? | 1(0.4) | 1(0.4) | 275(99.3) |
| To your knowledge are you, or have you been infected with Hepatitis B? | 260(93.9) | 13(4.7) | 4(1.4) |
| Do you know people in your immediate social environment who are or have been infected with Hepatitis B? | 205(74) | 22(7.9) | 50(18.1) |
| Is it possible for an infected apparently healthy person with no symptoms to spread the disease? | 15(5.4) | 21(7.6) | 241(87) |
| Does your current curriculum cover the risks and prevention strategies for Hepatitis B? | 125(45.1) | 43(15.5) | 109(39.4) |
| Is it possible for a Hepatitis B positive person to be asymptomatic? | 4(1.4) | 35(12.6) | 238(85.9) |
| Only the elderly are at risk of being infected with Hepatitis B | 250(90.3) | 16(5.8) | 11(4) |
| Children and adolescents have no risk of death due to Hepatitis B | 234(84.5) | 34(12.3) | 9(3.2) |
| There is currently an effective drug for the treatment of Hepatitis B | 119(43) | 76(27.4) | 82(29.6) |
| Symptoms of Hepatitis B include | | | |

| | | | |
|---|---|---|---|
| Fever | 48(17.3) | - | 229(82.7) |
| Bloated belly | 175(63.2) | - | 102(36.8) |
| Shortness of breath | 203(73.3) | - | 74(26.7) |
| Jaundice | 29(10.5) | - | 248(89.5) |
| Fatigue | 102(36.8) | - | 175(63.2) |
| Abdominal pain | 130(46.9) | - | 147(53.1) |
| Nausea | 234(84.5) | - | 43(15.5) |
| Frequent urination | 218(78.7) | - | 59(21.3) |
| Transmission of Hepatitis B can occur via: | | | |
| sharing needles or syringes | 14(5.1) | 0(0) | 263(94.9) |
| sexual contact | 12(4.3) | 0(0) | 255(92.1) |
| Semen or blood from an infected person | 21(7.6) | 18(6.5) | 238(85.9) |
| mother to baby during childbirth | 57(20.6) | 0(0) | 220(79.4) |
| food and water | 248(89.5) | 0(0) | 29(10.5) |
| insects and animals | 259(93.5) | 0(0) | 18(6.5) |
| What group of people are eligible to take the vaccine now? | | | |
| Infants (children less than one year) | 134(48.4) | - | 143(51.6) |
| Children and adolescents (less than 18 years) | 65(23.5) | - | 212(76.5) |
| Adults >18 years | 16(5.8) | - | 261(94.2) |
| Pregnant women and breastfeeding mothers | 172(62.1) | - | 105(37.9) |
| People who have active Hepatitis B infection | 247(89.2) | - | 30(10.8) |
| The available Hepatitis B vaccine in Nigeria is administered in how many doses? | | | |
| In Three Doses | 84 (30.3) | - | 193 (69.7) |
| In Two Doses | 209 (75.5) | - | 68 (24.5) |
| Single Dose | 261 (94.2) | - | 16 (5.8) |
| The Hepatitis B vaccine is administered through what route? | | | |
| Intramuscular | 9 (3.2) | | 268 (96.8) |
| Oral | 268 (96.8) | - | 9(3.2) |
| Immunity against Hepatitis B infection will be achieved after what dose? | | | |
| Don't know | 22 (79.4) | | 57 (20.6) |
| First dose of vaccination | 250 (90.3) | - | 27 (9.7) |
| Second dose of vaccination | 206 (74.4) | - | 71 (25.6) |
| Third dose of vaccination | 155 (56.0) | | 122(44.0) |

**Perceptions of respondents about Hepatitis B**

The perceptions of respondents regarding Hepatitis B varied (Table 3). Majority, 109 (39.4%) strongly agreed that it posed a personal risk to them, were concerned of contacting the infection, 136 (49.1%) and 165 (59.6%) strongly agreed that vaccination is effective in prevention of infection. One hundred and seventy-three (62.5%) also strongly agreed that Hepatitis B poses a significant occupational hazard for medical and paramedical students, and that using protective measures helps

prevent infection during clinical practice, 135 (48.7%).

**Table 3: Perception of respondents about Hepatitis B**

| Variable | Strongly agree n(%) | Agree n(%) | Neutral n(%) | Disagree n(%) | Strongly disagree n(%) |
|---|---|---|---|---|---|
| Hepatitis B poses a risk to you personally | 109 (39.4%) | 89 (32.1%) | 46 (16.6%) | 24 (8.7%) | 9 (3.2%) |
| You should be concerned about your risk of contracting Hepatitis B? | 136 (49.1%) | 112 (40.4%) | 24 (8.7%) | 1 (0.4%) | 4 (1.4%) |
| Vaccination will be effective in preventing Hepatitis B? | 165 (59.6%) | 100 (36.1%) | 11 (4%) | 1 (0.4%) | 0 (0%) |
| Do you believe that Hepatitis B is a significant occupational hazard for medical and paramedical students? | 173 (62.5%) | 80 (28.9%) | 20 (7.2%) | 4 (1.4%) | 0 (0%) |
| Use of protective measures (e.g., gloves, masks) helps to prevent Hepatitis B infection during clinical practice? | 135 (48.7%) | 110(39.7 %) | 23 (8.3%) | 8 (2.9%) | 1 (0.4%) |

**Attitude to Hepatitis B and vaccination**

Table 4 revealed that 233 (84.1%) respondents agreed and strongly agreed that everyone should contribute to reducing the spread of Hepatitis B. Most, 251 (90.6%) however disagreed and strongly disagreed with the notion that they are too young or healthy to be concerned about the disease.

The majority 166, (60.0%) agreed with the adequacy of preventive measures in place, while 246, (88.8%) disagreed with the idea that only those at risk of serious illness should be vaccinated.

Also, 213, (76.9%) of respondents disagreed with the misconception that a single dose of vaccination offers full protection against infection, and 208 (75.1%) dismissed the belief that vaccination could cause Hepatitis B

Overall, majority of respondents, 179 (64.6%) had a positive attitude towards Hepatitis B and vaccination, showing strong support for prevention and personal responsibility, while 13, (4.7%) and 85 (30.7%) respondents had neutral and negative attitudes towards Hepatitis B and vaccination respectively.

**Table 4: Attitude to Hepatitis B and Hepatitis B vaccination**

| Variable | Strongly agree n (%) | Agree n (%) | Neutral n (%) | Disagree n (%) | Strongly disagree n (%) |
|---|---|---|---|---|---|
| We are all responsible for reducing the spread of the virus | 123 (44.4%) | 110 (39.7%) | 15 (5.4%) | 5 (1.8%) | 24 (8.7%) |
| I am too young or healthy to be bothered about Hepatitis B | 3 (1.1%) | 10 (3.6%) | 13 (4.7%) | 117 (42.2%) | 134 (48.4%) |
| I trust the government to manage Hepatitis B in Nigeria | 2 (0.7%) | 20 (7.2%) | 70 (25.3%) | 83 (30%) | 102 (36.8%) |
| To what extent do you agree with the current preventive measures in place such as vaccination and safe sex. | 55 (19.9%) | 111 (40.1%) | 72 (26%) | 22 (7.9%) | 17 (6.1%) |
| Only people at risk of serious illness from Hepatitis B should be vaccinated | 3 (1.1%) | 14 (5.1%) | 14 (5.1%) | 92 (33.2%) | 154 (55.6%) |

| | | | | | |
|---|---|---|---|---|---|
| One dose of Hepatitis B vaccination will protect me from the virus | 3 (1.1%) | 14 (5.1%) | 47 (17%) | 102 (36.8%) | 111 (40.1%) |
| The Hepatitis B vaccination could give me Hepatitis B | 3 (1.1%) | 24 (8.7%) | 42 (15.2%) | 90 (32.5%) | 118 (42.6%) |
| The Hepatitis B vaccination is too new for me to be confident about it | 7 (2.5%) | 14 (5.1%) | 53 (19.1%) | 103 (37.2%) | 100 (36.1%) |
| After being vaccinated, I do not need to practice safe sex and take other precautions. | 2 (0.7%) | 8 (2.9%) | 17 (6.1%) | 84 (30.3%) | 166 (59.9%) |
| It is important to get a vaccine to protect people from Hepatitis B | 143 (51.6%) | 70 (25.3%) | 16 (5.8%) | 17 (6.1%) | 31 (11.2%) |

**Willingness to take the vaccine**

Almost all the respondents in this study, 263 (94.9%) are aware of the availability of the Hepatitis B vaccine (Table 5). However, only 118 (42.6%) believe they can afford the vaccine.

One hundred and forty-nine respondents (53.8%) had either been tested for, or received the vaccine. Some reasons given for not being tested or vaccinated were lack of time, 75 (60%), cost, 42 (33.6%), lack of perceived risk, 38 (30.4%) and lack of awareness of testing facilities, 34 (27.2%) among others, but 218 (78.7%) expressed their willingness to take the vaccine, and of those who did so, 159 (72.9%) are very likely to recommend it to their peers (Figure 1).

Reported factors influencing the decision to get vaccinated against Hepatitis B include information about vaccine safety and efficacy, 221 (97.1%), recommendations from healthcare professionals, 212 (93.4%), costs 182 (80.2%), concerns about vaccine side effect, 131 (57.7%) and peer influence, 80 (35.2%) (Figure 2).

**Table 5: Willingness to take the vaccine**

| Variable | No<br>n (%) | Not certain n<br>(%) | Yes<br>n (%) |
|---|---|---|---|
| Are you aware that a Hepatitis B vaccine is now available? | 10 (3.6) | 4 (1.4) | 263 (94.9) |
| Can you afford the cost of vaccine? | 119 (43.0) | 40 (14.4) | 118 (42.6) |
| Have you ever been tested or vaccinated for Hepatitis B? | 125(45.1) | 3(1.1) | 149(53.8) |
| If you haven't been tested or vaccinated, what are the reasons behind this decision? | | | |
| Lack of time | 50(40.0) | - | 75(60.0) |
| Cost of testing | 83(66.4) | - | 42(33.6) |
| Lack of perceived risk | 87(69.6) | - | 38(30.4) |
| Lack of awareness about testing facilities | 91(72.8) | - | 34(27.2) |
| No response | 111(88.8) | - | 14(11.2) |
| Fear of knowing the results | 123(98.4) | - | 12(9.6) |
| Didn't see the need to | 121(96.8) | - | 4(3.2) |
| No particular reason | 123(98.4) | - | 2(1.6) |
| Not sexually active | 124(99.2) | - | 1(0.8) |
| If you have not been vaccinated, are you willing to take the vaccine? | 19 (6.9) | 40 (14.4) | 218 (78.7) |
| To the best of your knowledge, can Hepatitis B vaccine give you side effects? | 51(18.4) | 66(23.8) | 160(57.8) |

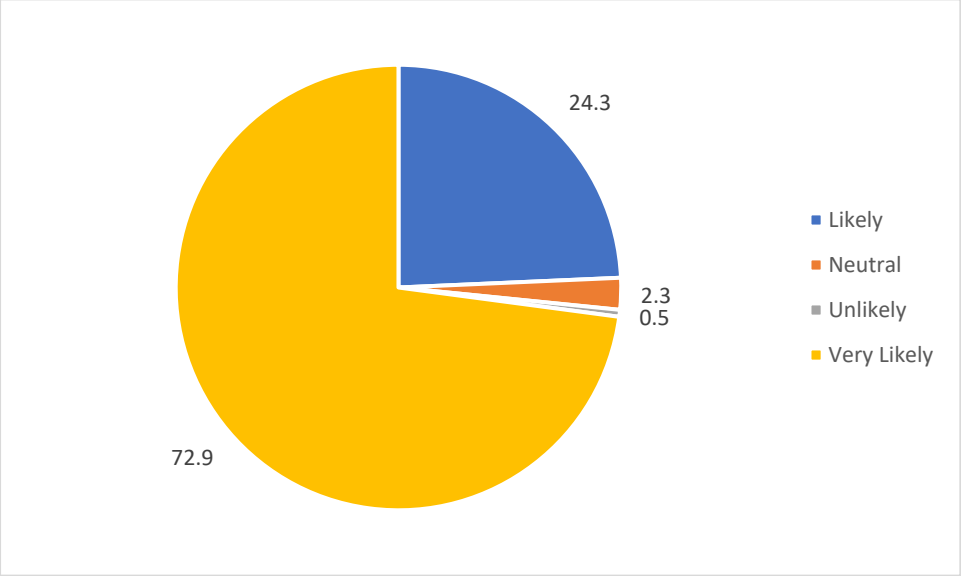



**Figure 1: Likelihood of recommending Hepatitis B vaccination to peers**

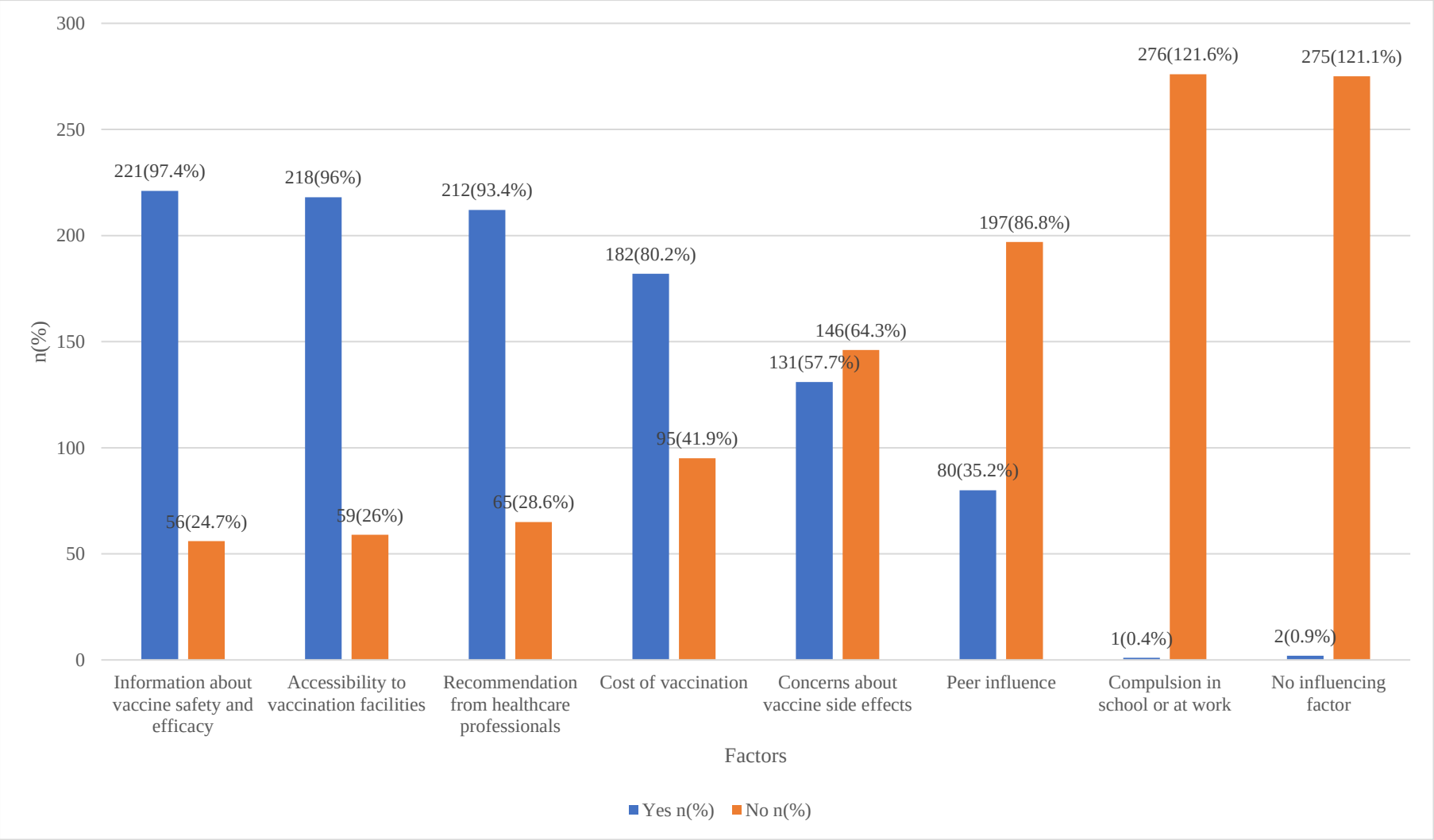



**Figure 2: Factors influencing the decision to get vaccinated against Hepatitis B (N=277)**

**Association between socio-demographic factors, attitude and willingness to take Hepatitis B vaccine.**

According to table 6, there was a statistically significant association between gender, respondent's faculty of study and attitude towards Hepatitis B infection (p=0.001 and p=0.030) respectively. Female respondents had a higher proportion of positive attitudes compared to their male counterparts. Likewise, respondents in Basic Medical and Clinical Sciences also portrayed a higher proportion of positive attitudes compared to those in Pharmacy.

In the same manner, a statistically significant association was also observed with respondents gender, faculty and course of study with willingness to take Hepatitis B vaccine (p=0.016 &and p<0.001; Table 7). A higher proportion of females compared to males, and respondents in medical laboratory sciences, compared to other disciplines, were willing to take the vaccine.

**Table 6: Association between socio-demographics of respondents and attitude**

| **Variable** | **Attitude level** | | | | $X^2$ | ***p*-value** |
|---|---|---|---|---|---|---|
| **Age (In years)** | Negative attitude | Neutral attitude | Positive attitude | Total | | |
| <20 | 0(0%) | 0(0%) | 2(100%) | 2(100%) | 3.502 | 0.744 |
| 20 – 25 | 12(4.8%) | 78(31.1%) | 161(64.1%) | 251(100%) | | |
| 26 – 30 | 1(5%) | 7(35%) | 12(60%) | 20(100%) | | |
| >30 | 0(0%) | 0(0%) | 4(100%) | 4(100%) | | |
| Total | 13(4.7%) | 85(30.7%) | 179(64.6%) | 277(100%) | | |
| **Gender** | | | | | | |
| Female | 4(2.8%) | 32(22.5%) | 106(74.6%) | 142(100%) | 13.027 | **0.001** |
| Male | 9(6.7%) | 53(39.3%) | 73(54.1%) | 135(100%) | | |
| Total | 13(4.7%) | 85(30.7%) | 179(64.6%) | 277(100%) | | |
| **Ethnicity** | | | | | | |
| Hausa | 0(0%) | 1(25%) | 3(75%) | 4(100%) | 6.234 | 0.398 |
| Igbo | 0(0%) | 15(38.5%) | 24(61.5%) | 39(100%) | | |
| Others | 0(0%) | 7(25%) | 21(75%) | 28(100%) | | |
| Yoruba | 13(6.3%) | 62(30.1%) | 131(63.6%) | 206(100%) | | |
| Total | 13(4.7%) | 85(30.7%) | 179(64.6%) | 277(100%) | | |
| **Religion** | | | | | | |
| Agnostic | 0(0%) | 0(0%) | 1(100%) | 1(100%) | 5.899 | 0.435 |
| Atheist | 0(0%) | 0(0%) | 2(100%) | 2(100%) | | |
| Christianity | 8(3.8%) | 71(33.6%) | 132(62.6%) | 211(100%) | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Islamic | 5(7.9%) | 14(22.2%) | 44(69.8%) | 63(100%) | | |
| Total | 13(4.7%) | 85(30.7%) | 179(64.6%) | 277(100%) | | |
| **Marital status** | | | | | | |
| Married | 0(0%) | 1(20%) | 4(80%) | 5(100%) | 0.615 | 0.735 |
| Single | 13(4.8%) | 84(30.9%) | 175(64.3%) | 272(100%) | | |
| Total | 13(4.7%) | 85(30.7%) | 179(64.6%) | 277(100%) | | |
| **Current level** | | | | | | |
| 300L | 1(2.6%) | 5(13.2%) | 32(84.2%) | 38(100%) | 10.137 | 0.119 |
| 400L | 4(3.5%) | 41(36%) | 69(60.5%) | 114(100%) | | |
| 500L | 6(5.6%) | 33(30.8%) | 68(63.6%) | 107(100%) | | |
| 600L | 2(11.1%) | 6(33.3%) | 10(55.6%) | 18(100%) | | |
| Total | 13(4.7%) | 85(30.7%) | 179(64.6%) | 277(100%) | | |
| **Faculty** | | | | | | |
| Basic Medical Science | 1(1.4%) | 17(23.9%) | 53(74.6%) | 71(100%) | 10.744 | **0.030** |
| Clinical Sciences | 6(6.9%) | 21(24.1%) | 60(69%) | 87(100%) | | |
| Pharmacy | 6(5%) | 47(39.5%) | 66(55.5%) | 119(100%) | | |
| Total | 13(4.7%) | 85(30.7%) | 179(64.6%) | 277(100%) | | |
| **Course of study** | | | | | | |
| Medicine and Surgery | 3(5.8%) | 14(26.9%) | 35(67.3%) | 52(100%) | 11.244 | 0.081 |
| MLS | 1(1.5%) | 17(25%) | 50(73.5%) | 68(100%) | | |
| Nursing | 3(7.9%) | 7(18.4%) | 28(73.7%) | 38(100%) | | |
| Pharmacy | 6(5%) | 47(39.5%) | 66(55.5%) | 119(100%) | | |
| Total | 13(4.7%) | 85(30.7%) | 179(64.6%) | 277(100%) | | |

**Table 7: Association between socio-demographic factors and willingness to take vaccine**

| **Variable** | **Willingness to take the vaccine** | | | | **$X^2$** | ***p*-value** |
|---|---|---|---|---|---|---|
| **Age (In years)** | No | Not certain | Yes | Total | | |
| < 20 | 0(0%) | 0(0%) | 2(100%) | 2(100%) | 3.926 | 0.687 |
| 20 – 25 | 19(7.6%) | 38(15.1%) | 194(77.3%) | 251(100%) | | |
| 26 – 30 | 0(0%) | 2(10%) | 18(90%) | 20(100%) | | |
| >30 | 0(0%) | 0(0%) | 4(100%) | 4(100%) | | |
| Total | 19(6.9%) | 40(14.4%) | 218(78.7%) | 277(100%) | | |
| **Gender** | | | | | | |
| Female | 4(2.8%) | 24(16.9%) | 114(80.3%) | 142(100%) | 8.256 | **0.016** |

| | | | | | | |
|---|---|---|---|---|---|---|
| Male | 15(11.1%) | 16(11.9%) | 104(77%) | 135(100%) | | |
| Total | 19(6.9%) | 40(14.4%) | 218(78.7%) | 277(100%) | | |
| **Ethnicity** | | | | | | |
| Hausa | 0(0%) | 1(25%) | 3(75%) | 4(100%) | 6.328 | 0.388 |
| Igbo | 5(12.8%) | 8(20.5%) | 26(66.7%) | 39(100%) | | |
| Others | 1(3.6%) | 2(7.1%) | 25(89.3%) | 28(100%) | | |
| Yoruba | 13(6.3%) | 29(14.1%) | 164(79.6%) | 206(100%) | | |
| Total | 19(6.9%) | 40(14.4%) | 218(78.7%) | 277(100%) | | |
| **Religion** | | | | | | |
| Agnostic | 0(0%) | 0(0%) | 1(100%) | 1(100%) | 10.008 | 0.124 |
| Atheist | 0(0%) | 0(0%) | 2(100%) | 2(100%) | | |
| Christianity | 18(8.5%) | 36(17.1%) | 157(74.4%) | 211(100%) | | |
| Islamic | 1(1.6%) | 4(6.3%) | 58(92.1%) | 63(100%) | | |
| Total | 19(6.9%) | 40(14.4%) | 218(78.7%) | 277(100%) | | |
| **Marital status** | | | | | | |
| Married | 0(0%) | 0(0%) | 5(100%) | 5(100%) | 1.378 | 0.502 |
| Single | 19(7%) | 40(14.7%) | 213(78.3%) | 272(100%) | | |
| Total | 19(6.9%) | 40(14.4%) | 218(78.7%) | 277(100%) | | |
| **Current level in area of study** | | | | | | |
| 300L | 2(5.3%) | 5(13.2%) | 31(81.6%) | 38(100%) | 9.227 | 1.161 |
| 400L | 10(8.8%) | 24(21.1%) | 80(70.2%) | 114(100%) | | |
| 500L | 6(5.6%) | 9(8.4%) | 92(86%) | 107(100%) | | |
| 600L | 1(5.6%) | 2(11.1%) | 15(83.3%) | 18(100%) | | |
| Total | 19(6.9%) | 40(14.4%) | 218(78.7%) | 277(100%) | | |
| **Faculty** | | | | | | |
| Basic Medical Science | 6(8.5%) | 1(1.4%) | 64(90.1%) | 71(100%) | 27.431 | **<0.001** |
| Clinical Sciences | 2(2.3%) | 9(10.3%) | 76(87.4%) | 87(100%) | | |
| Pharmacy | 11(9.2%) | 30(25.2%) | 78(65.5%) | 119(100%) | | |
| Total | 19(6.9%) | 40(14.4%) | 218(78.7%) | 277(100%) | | |
| **Course of study** | | | | | | |
| Medicine and Surgery | 3(5.8%) | 3(5.8%) | 46(88.5%) | 52(100%) | 28.679 | **<0.001** |
| MLS | 5(7.4%) | 1(1.5%) | 62(91.2%) | 68(100%) | | |
| Nursing | 0(0%) | 6(15.8%) | 32(84.2%) | 38(100%) | | |
| Pharmacy | 11(9.2%) | 30(25.2%) | 78(65.5%) | 119(100%) | | |
| Total | 19(6.9%) | 40(14.4%) | 218(78.7%) | 277(100%) | | |

**Discussion**

This study examined the attitudes and perceptions of undergraduate students in the College of Medicine and Faculty of Pharmacy at the University of Lagos regarding Hepatitis B and their willingness to receive the vaccine. The findings revealed that over half of the students possessed substantial knowledge about Hepatitis B, and over half also demonstrated a positive attitude toward vaccination. About three-quarters demonstrated willingness to be vaccinated and also a willingness to recommend it to their peers. Notably, the study identified significant differences in attitudes and vaccine willingness based on gender and academic discipline.

The findings from this study show that the respondents were aware and knowledgeable about Hepatitis B which could have been due to their course of study. The knowledge level of Hepatitis B found among our respondents was lower than that found among undergraduate clinical medical students in Abakaliki, Nigeria where 80.7% of the respondents had good knowledge of HBV infection (Eze *et al*., 2020). Our study had a combination of medical and paramedical students, unlike the study in Abakaliki where all respondents were clinical medical students. This may suggest that clinical medical students may have much more information and exposure related to Hepatitis B than others. In contrast, the awareness level in our study by over half of the rspondents is similar to the findings of a study conducted among 5346 Freshmen of all disciplines in Jiangsu, and another study conducted among College of Medicine students in Enugu, Nigeria where the awareness and knowledge level was 63.1% and 68.2% respectively (Tu *et al*., 2022; Orji *et al*., 2020). Our findings also agree with findings from an observational study conducted across 12 African countries where medical trainees had the highest serostatus awareness, vaccination rate, and vaccination of their children than healthcare workers in other occupations (Shah *et al*., 2020). This demonstrates that persons in health-related fields typically possess high awareness levels due to their exposure and access to health information.

The majority, about three-quarters, of our respondents agreed that hepatitis B poses personal risks to them, and that it is a significant occupational hazard. Our finding is similar to that found in a study conducted among students in Jos, Nigeria where the perceived risk of contracting Hepatitis B was 76.8% (Chingle *et al*., 2017). With such risk perception, almost all the respondents believed that vaccination

would be effective in preventing contracting the virus. Hence many of them reported that they are willing to take the vaccine and recommend it to others. Also, about half of our respondents reported that they had taken the vaccine. This number of vaccinated respondents may have been due to the inclusion of HBV in the national childhood immunizaiton schedule (FMOH, 2016).

This positive attitude agrees with other studies conducted among healthcare workers in Abuja, and Abakaliki, Nigeria, where 62.7% and 74.3% respectively agreed to the risks posed by hepatitis B, and 97% and 84.2% respectively were willing to receive the vaccine (Ogundele *et al*., 2017, Eze *et al*., 2020). The implication of willingness to take the vaccine by healthcare workers or medical and paramedical students is reflected in the recommendation of the vaccine to others. Willingness is also reflective of successful educational and promotional efforts in promoting a positive attitude towards vaccination. The study conducted in Jos showed that 60.2% of medical students had taken the full dose of the vaccine compared to students from nursing (20.6%), and Public Administration (15.4%). Furthermore, regarding the uptake of the vaccine, 96.3% of respondents in the study conducted among medical students in India opined that everyone should be vaccinated (Rathi *et al*., 2018).

From these studies, a positive attitude seems to be common in health-oriented groups. This may be said to stem from respondents' academic or professional background which familiarises them with the benefits of vaccination in preventing diseases. The positive attitude may have also resulted from educational initiatives and public health education on awareness and acceptance of the vaccine. Furthermore, a study done in Malaysia reported that individuals with higher education have greater access to information related to hepatitis B from various sources and therefore are more likely to have better knowledge (Rajamoorthy *et al*., 2019). A study conducted among 270 secondary school students in Kaduna, Nigeria, to assess their knowledge of causes, attitude, and perception of HBV infection, reported that there was a significant relationship between class and attitude to Hepatitis B infection among the SS2 and SS3 students (Toriola *et al*., 2024). However, our study identified an association between gender and attitude, and course of study and gender as critical factors influencing willingness to participate in vaccination. This suggests that a stronger emphasis on preventive health measures in medical curricula can

improve vaccination uptake. This study found that the decision to get vaccinated against Hepatitis B included a recommendation from healthcare professionals, information about vaccine safety and efficacy, access to vaccination facilities, and the cost of the vaccine. However, the variation in willingness based on academic level and course of study observed in our study points to the importance of targeted educational strategies.

Additionally, respondents in Medicine and Surgery and Medical Laboratory Science departments exhibited higher willingness compared to those in other courses. This may be due to the greater emphasis on preventive health measures and disease management in these fields. This is different from the study conducted in Jos, where students in Medicine and Surgery (60.2%) and Nursing (24.6%) had taken the full dose of the vaccine compared to those in Public Admin (15.1%) (Chingle *et al*., 2017). Other studies have reported poor knowledge, negative attitudes, and poor prevention practices of Hepatitis B in communities in Gondar Town, Ethiopia, and among Medical, Dental, Nursing and Physiotherapy students in Kerala's Kozhikode district in India (Angelo *et al*., 2024; Divya *et al.,* 2024). These differences show the need for continuous educational information to promote positive attitudes, better prevention practices, and uptake of the vaccine.

The fact that a few of our study population had been infected with HBV, and about one-fifth knew someone in their immediate environment who has been infected with HBV implies that Hepatitis B infection is in proximity, particularly in closely-knit campus communities. This illustrates the need for vaccination to get protected especially among the sociodemographics of our study population. The four top reasons for not being tested or vaccinated include lack of time, cost, lack of perceived risk, and lack of awareness of testing facilities. This is similar to findings from the Abakaliki study where cost, access, and lack of interest were the top three reasons for not being vaccinated (Eze et al., 2020). Hence, more educational efforts, intersectorial collaboration would improve testing and vaccination through better accessibility and affordability of the vaccine.

Our study has a few limitations that require careful interpretation of our findings. It was conducted among undergraduate medical and paramedical students on a single campus, which limits the generalizability of the results. Therefore, caution should be

exercised when interpreting and applying these findings to broader populations.

**Recommendations**

Our study shows that majority of the students reported lack of time for not being tested or vaccinated. This calls for intersectorial collaboration where testing and vaccination can be taken to the College of Medicine and the Faculty of Pharmacy for easy access. This can also be extended to other departments of the University of Lagos to cover the students population. We suggest that further studies be conducted among students from other faculties in the university to enable planned intervention for improving Hepatitis B vaccine uptake.

**Conclusion**

The study demonstrated a predominantly positive attitude towards both Hepatitis B and its vaccine among respondents. A significant majority of respondents displayed a favorable view of the vaccine. This positive attitude is crucial as it reflects the possibility of encouraging peers to positive attitude and uptake of the vaccine. The cost of the vaccine, access to health facilities, and lack of time were some constraining factors to not being tested or vaccinated for HBV. More educational efforts, intersectorial collaboration for discounted vaccination programs, and student participation in Hepatitis B programmes are recommended to promote vaccine uptake among undergraduates in Nigerian universities.

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**Conflict of interest**

The authors declare no conflict of interest.

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