**PREVALENCE OF HEPATITIS B INFECTION AND ASSOCIATED FACTORS AMONG STUDENTS OF TERTIARY INSTITUTION IN EKITI STATE, NIGERIA**

**Abstract**

Hepatitis B virus (HBV) infection remains a major global public health challenge, with a disproportionately high burden in sub-Saharan Africa. Due to high behavioral practices such as, drug injection, unprotected sex, multiple sex partner among students of higher learning, this study investigated the prevalence, associated risk factors, awareness, and vaccination status of HBV among students of the College of Health Sciences and Technology, Ijero Ekiti, Ekiti State, Nigeria. 544 participants were randomly selected use a cross-sectional design study. The participants were asked to fill structured questionnaires and underwent serological testing for hepatitis B surface antigen (HBsAg). Findings revealed that 20 students (4%) were HBsAg-positive, while 524 (96%) tested negative. Residence significantly influenced infection rates, with urban dwellers showing a higher prevalence (7.3%) compared to rural residents (2.6%, p = 0.018). Key behavioral risk factors included unprotected sexual intercourse (7.6% vs. 2.7%, p = 0.016) and sharing of sharp objects (6.8% vs. 2.2%, p = 0.019). Awareness of HBV was relatively high (80.9%), with 66.2% correctly identifying it as a viral disease. However, misconceptions persisted, particularly regarding mother-to-child transmission and vaccine availability. Vaccination uptake was notably poor, with only 6.7% of participants ever vaccinated, and just 20% completing the three-dose schedule. Lack of awareness (57.8%) was the most commonly reported barrier to vaccination. In conclusion, HBV prevalence among students was of intermediate level, with infection strongly associated with risky behaviors and inadequate vaccination coverage. The findings highlight the need to strengthen routine vaccination programs and implementing targeted health education interventions to reduce HBV transmission and improve health outcomes in this population

**Keywords:** Hepatitis B virus (HBV), Vaccination, Seroprevalence, behaviors, Awareness

**Introduction**

Hepatitis B virus (HBV) infection is a major global public health challenge, with an estimated 296 million people living with chronic HBV worldwide in 2019 and about 820,000 annual deaths due to complications such as cirrhosis and hepatocellular carcinoma (WHO, 2021). The global prevalence of HBV varies geographically, with the highest rates recorded in sub-Saharan Africa and East Asia, where the prevalence of chronic HBV infection ranges from 5–12% in the general population (Al-Busafi & Alwassief, 2024; Kaewdech et al., 2025; WHO, 2017, Schweitzer et al., 2015). In contrast, regions such as North America and Western Europe record much lower prevalence, typically below 2% (WHO, 2022).

In Africa, approximately 81 million people are chronically infected with HBV, representing a regional prevalence of about 7.5% (WHO, 2021). Transmission is commonly sustained through perinatal infection, horizontal transmission among children, unsafe medical practices, and traditional cultural practices involving scarification or tattooing (Mohamud et al., 2024). In Asia, the

burden remains significant, with countries such as China reporting HBV prevalence of 5-7%, and parts of Southeast Asia reporting rates as high as 8-10%, despite widespread introduction of vaccination programs (Kaewdech et al., 2025; Al-Busafi & Alwassief, 2024; Li et al;, 2021; Schweitzer et al., 2015; Ott et al., 2012).

Nigeria bears one of the highest burdens of HBV infection globally, with prevalence estimates ranging between 8% and 12% in the general population (Ajuwon et al., 2021; Musa et al., 2015). A recent systematic review and meta-analysis reported a pooled prevalence of 12.2% among Nigerians, classifying the country as a highly endemic region (Musa et al., 2015). This translates to millions of individuals at risk of HBV-related complications, with significant implications for healthcare delivery and the economy. The persistence of high prevalence in Nigeria is attributed to vertical transmission, poor vaccination uptake, limited screening, and widespread risky cultural practices such as sharing sharp instruments and unsterile body modifications (Oti et al., 2017).

Despite the availability of effective vaccines and antiviral therapy, awareness and knowledge of HBV infection remain suboptimal in many Nigerian communities. Studies have shown that misconceptions about HBV transmission, poor integration of HBV education into primary healthcare, and inadequate public health campaigns contribute to sustained transmission (Li, et al., 2024; Oti et al., 2017). Young people constitute the majority of the university population, and several studies have shown a higher prevalence of hepatitis B in this group, largely due to greater exposure to risk factors such as unprotected sex, sharing of sharp objects, and other risky behaviors. For instance, a study among secondary school students in Onitsha, South-East Nigeria, reported an HBsAg prevalence of 7.6%, with the highest rates among adolescents aged 14–16 years and vaccination coverage of only 4.3% (Odita et al., 2023). Similarly, Ndubuisi et al. (2022) at Nasarawa State University, Keffi, found a notable prevalence of HBV among students of the Faculty of Natural and Applied Sciences, underscoring the vulnerability of young people in academic settings and the urgent need for targeted vaccination and preventive interventions.

Given this background, there is a pressing need for localized data on HBV prevalence, awareness, and associated factors across different Nigerian populations. Such evidence is critical for guiding targeted interventions, improving vaccination coverage, and reducing the long-term burden of HBV-related morbidity and mortality.

Therefore, this study was conducted to determine the prevalence of HBV infection and identify associated sociodemographic and behavioral factors among participants in a tertiary institution in Ekiti state, Nigeria.

**Methodology**

A quantitative, non-experimental, descriptive cross-sectional study was conducted among students of the College of Health Sciences and Technology, Ijero-Ekiti, Ekiti State, Nigeria, between May and July 2025. Eligible participants were individuals aged ≥18 years who provided informed consent, while those with bleeding disorders or who declined participation were excluded. The sample size was determined using Taro Yamane’s (1967) formula for populations less than 10,000 (Yamane, 1967). A total of 544 consenting participants, randomly selected from among the students, were screened for hepatitis B surface antigen (HBsAg). A structured questionnaire was also administered to collect information on their socio-demographic characteristics, knowledge of HBV, risk behaviors, vaccination and testing history, medical history, and family background. HBsAg detection was performed using the PROMED rapid test kit (lateral flow immunoassay) following the manufacturer’s instructions. Approximately 30–50 µL of capillary blood was applied to the test cassette, followed by assay buffer. Results were interpreted at 15 minutes: two lines (C and T) indicated a positive result, one line (C) negative, and absence of the C line invalid. Positive and negative controls were routinely included for quality assurance (Shenge et al., 2021; Amini et al., 2017).

Data were entered into Microsoft Excel (version 2021) and analyzed using descriptive statistics to generate frequencies and percentages. HBV prevalence was expressed as the proportion of HBsAg-positive participants, and associations between variables were assessed using Chi-square tests at a significance level of p < 0.05.

**RESULTS**

**Sociodemographic characteristics of study participants**

Table 1: Sociodemographic characteristics of study participants (N=544)

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Category | Frequency | Percent |
| Age (years)  Mean ± SD =  23.40 ± 7.14 | >20 | 120 | 22.1 |
| 20-29 | 361 | 66.4 |
| 30-39 | 26 | 4.8 |
| 40-49 | 33 | 6.1 |
| >50 | 4 | 0.7 |
| Gender | Male | 69 | 12.7 |
| Female | 458 | 84.2 |
| Other | 17 | 3.1 |
| Marital Status | Single | 444 | 81.6 |
| Married | 84 | 15.4 |
| Divorced | 7 | 1.3 |
| Widowed | 9 | 1.7 |
| Which course did you study? | Health-related course | 514 | 94.5 |
| Engineering | 4 | 0.7 |
| Administration | 26 | 4.8 |
| Religion | Christianity | 401 | 73.7 |
| Islam | 136 | 25.0 |
| Traditional | 5 | 0.9 |
| Other | 2 | 0.4 |
| Location | Urban | 218 | 40.1 |
| Rural | 326 | 59.9 |
| Ethnicity | Hausa | 17 | 3.1 |
| Igbo | 19 | 3.5 |
| Yoruba | 485 | 89.2 |
| Others | 23 | 4.2 |
| Total | 544 | 100.0 |

The sociodemographic characteristics of the study participants in Table 1 revealed that the mean age was 23.40 ± 7.14 years, with the majority (66.4%) aged between 20–29 years, Females constituted the majority of the participants (84.2%) and most participants were single (81.6%). A large proportion of participants (94.5%) are studying health-related courses, Christianity was the dominant religion (73.7%), followed by Islam (25.0%), and 59.9% of the participants resided in rural areas. Regarding ethnicity, most respondents were Yoruba (89.2%), while Igbo (3.5%), Hausa (3.1%), and other ethnic groups (4.2%) accounted for a minority.

Figure 1: Prevalence of Hepatitis B infection among the study participants (N=544)

Figure 1 shows that out of the 544 study participants, 20 individuals (4%) tested positive for Hepatitis B infection, while the vast majority, 524 (96%), participants tested negative.

Table 2: Association between demographic factors and HBV infection among study participants (N=544)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Category | Hepatitis B infection | | Total | *p*-value |
| Positive | Negative |
| Age (years) | >20 | 2(10.0) | 118(32.5) | 120 | 0.562 |
| 20-29 | 15(75.0) | 346(66.0) | 361 |  |
| 30-39 | 2(10.0) | 24(4.6) | 26 |  |
| 40-49 | 1(5.0) | 32(6.1) | 33 |  |
| >50 | 0(0) | 4(0.8) | 4 |  |
| Gender | Male | 5(25.0) | 64(12.2) | 69 | 0.201 |
| Female | 14(70.0) | 444(84.7) | 458 |  |
| Other | 1(5.0) | 16(3.1) | 17 |  |
| Permanent place of residence | Urban | 13(3.6) | 205(94.0) | 218 | **0.020** |
| Rural | 7(2.1) | 319(97.9) | 326 |  |

\* n (%): Frequency (Percentage) *p*<0.05 is significant

Age and gender were not significantly associated with HBV, although prevalence was slightly higher among female (70%) and those aged 20–29 years (75.0%).

In contrast, location was significantly associated with HBV infection (p = 0.020), with urban dwellers showing a higher prevalence (6.0%) compared to those in rural areas (2.1%).

**Table 3: Behavioural and lifestyle factors that may contribute to HBV transmission among study participants (N=544)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Category | Hepatitis B Virus infection | | Total | *p*-value |
| Positive | Negative |
| Have you ever had unprotected sexual intercourse? | Yes | 12(6.5) | 172(92.4) | 184 | **0.012** |
| No | 8(2.2) | 352(97.8) | 360 |  |
| Do you have multiple sexual partners? | Yes | 2(3.7) | 52(96.3) | 52 | 0.704 |
| No | 18(3.7) | 472(96.3) | 472 |  |
| Have you ever shared sharp objects (razor, needles, clippers)? | Yes | 15(5.8) | 245(94.2) | 260 | **0.013** |
| No | 5(1.8) | 279(98.2) | 284 |  |
| Have you ever received a blood transfusion? | Yes | 3(5.8) | 49(94.2) | 52 | 0.399 |
| No | 17(3.5) | 475(96.5) | 475 |  |
| Do you have tattoos or body piercings? | Yes | 0(0) | 36(100) | 36 | 0.225 |
| No | 20(3.9) | 488(96.1) | 508 |  |
| Do you use injectable drugs? | Yes | 5(5.2) | 92(94.8) | 97 | 0.393 |
| No | 15(3.4) | 432(96.6) | 447 |  |
| Have you ever been diagnosed with any liver disease? | Yes | 0(0) | 19(100) | 19 | 0.386 |
| No | 20(3.8) | 505(96.2) | 525 |  |

\* n (%): Frequency (Percentage) *p*<0.05 is significant

Table 3 indicate that those who had ever engaged in unprotected sexual intercourse and those that shared sharp objects (razor, needles, clippers) showed a higher prevalence of infection (6.5…respectively). no statistical significant was observed among those that have multiple sexual partners, received a blood transfusion, have tattoos or body piercings, injectable drugs user or previously diagnosed with any liver

**Table 4: Level of awareness and knowledge about Hepatitis B infection among study participants (N=544)**

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Category | Frequency | Percent |
| Have you heard about Hepatitis B before? | Yes | 444 | 81.6 |
| No | 100 | 18.4 |
| What is the main cause of Hepatitis B? | Virus | 353 | 64.9 |
| Bacteria | 47 | 8.6 |
| I don't know | 92 | 16.9 |
| Other | 52 | 9.6 |
| How is hepatitis B transmitted? | Unprotected sex | 318 | 58.5 |
| Sharing needles/blades | 201 | 36.9 |
| Mother to child during birth | 160 | 29.4 |
| Blood transfusion | 163 | 30.0 |
| Through food and water | 32 | 5.9 |
| I don't know | 109 | 20.0 |
| Can Hepatitis B be prevented? | Yes | 433 | 79.6 |
| No | 24 | 4.4 |
| I don't know | 87 | 16.0 |
| Is there a vaccine for Hepatitis B? | Yes | 382 | 70.2 |
| No | 42 | 7.7 |
| I don't know | 120 | 22.1 |
| Total | 544 | 100.0 |

This result shows that 18.4% of the participants have not had about HBV, 35.1% failed to correctly identified HBV infection a viral infection, although awareness level was high but 25.% of the participants could not correctly mention the its mode of transmission. Also 40% of the respondents don’t know that HBV can be prevented. Similarly, 29.8% do know there is vaccine for HBV.

**Table 5: HBV testing and vaccination history of study participants N=544**

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Category | Frequency | Percent |
| Have you ever been tested for Hepatitis B? | Yes | 74 | 13.6 |
| No | 470 | 86.4 |
| If yes, what was the result? (N=74) | Positive | 25 | 33.8 |
| Negative | 49 | 66.2 |
| Have you been vaccinated against Hepatitis B? | Yes | 45 | 8.3 |
| No | 411 | 75.6 |
| Not sure | 88 | 16.2 |
| If vaccinated, how many doses did you receive? (N=45) | One | 30 | 66.7 |
| Two | 2 | 4.4 |
| All Three doses | 5 | 11.1 |
| I don't know | 8 | 17.8 |
| If not vaccinated, why? (N=411) | Not aware of the vaccine | 200 | 48.7 |
| Not available | 76 | 18.5 |
| Too expensive | 30 | 7.3 |
| Fear of injection | 50 | 7.5 |
| Other | 55 | 12.2 |
| Have you ever had a liver function test (e.g., ALT, AST)? | Yes | 29 | 5.3 |
| No | 460 | 84.6 |
| Don't know | 55 | 10.1 |
| Have you had any imaging tests like liver ultrasound or CT scan? | Yes | 36 | 6.6 |
| No | 508 | 93.4 |
| Total | 544 | 100.0 |

Table 5 provide insight into the testing and vaccination history of the study participants regarding Hepatitis B. the result shows that only small portion 13.6% had been previously screen for HBV infection.

Vaccination coverage was low as only 8.3% had been vaccinated against HBV while only 11.1% of them actually completed the recommended three-dose schedule.

The major observed barrier against vaccination from the table was lack of awareness of the vaccine (48.7%) and unavailability (18.5%) of the vaccine.

**Table 6: Association between Hepatitis B infection and history of vaccination against HBV among study participants**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Category | Hepatitis B virus infection | | Total | *p*-value |
| Positive | Negative |
| Have you been vaccinated against Hepatitis B? | Yes | 2(4.4) | 43(95.6) | 45 | 0.954 |
| No | 15(3.6) | 396(96.4) | 411 |  |
| Not sure | 3(3.4) | 85(96.6) | 88 |  |

\* n (%): Frequency (Percentage), *p*<0.05 is significant

The analysis of the association between Hepatitis B infection and history of vaccination against HBV in Table 6 showed no statistically significant relationship ( p = 0.954). Among participants who reported being vaccinated, 2 (4.4%) were positive for Hepatitis B compared to 15 (3.6%) of those who were not vaccinated and 3 (3.4%) of those who were unsure of their vaccination status.

Table 7: Effect of HBV infection on BMI of the participants

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Positive (n=20)  Mean ± SD | Negative (n=429)  Mean ± SD | t-value | df | p-value | Mean Difference | 95% CI  (Lower – Upper) | Significance |
| BMI | 10.75 ± 2.86 | 13.15 ± 52.39 | -0.92 | 444 | 0.358 | 13.32 | -10.373-37.022 | **No** |

\* SD: Standard deviation, df: Degrees of freedom, p<0.05 is significant, 95% CI: 95% Confidence Interval

The analysis shows no significant difference in BMI between positive and negative groups.

**Discussion**

This study assessed the prevalence of hepatitis B virus (HBV) infection and its associated factors among students in a tertiary institution. The findings revealed a prevalence rate of 4%, indicating that HBV remains an important public health issue in this population. This aligns with previous reports from Nigeria, where HBV prevalence has been consistently classified as high-intermediate endemicity (8-12%) (Ajuwon et al., 2024; Musa et al., 2015). Studies in other parts of West Africa, such as Togo, also show a similarly high burden, particularly among young adults (Kolou et al., 2017). The relatively high prevalence observed in this student cohort reflects ongoing transmission risks and limited uptake of preventive measures (Schweitzer et al., 2015; WHO, 2017).

Demographic factors, including age and marital status, showed variation in HBV infection rates. The higher prevalence among younger participants (21-30 years) is consistent with earlier reports that HBV infection often occurs in early adulthood due to risky behaviors such as unprotected sexual activity and sharing of sharp objects (Mohamud et al., 2024; Mohammed et al., 2023; Mohammed et al., 2022). Similar findings have been reported in studies from Makurdi (Mbaawuaga et al., 2024) where young adults demonstrated both significant exposure to infection and limited knowledge about prevention.

Behavioral and lifestyle factors were more strongly predictive of HBV status. Unprotected sexual intercourse and sharing of sharp objects were both significantly associated with HBV infection. This is consistent with the established epidemiology of HBV as a sexually transmitted and blood-borne pathogen (Tripathi & Mousa, 2023). Several Nigerian studies have similarly reported higher HBV prevalence among those with histories of risky sexual behavior or sharp object sharing (Alabi et al., 2023, Issa et al., 2023; Keffi (Pennap et al., 2011). In contrast, other anticipated risk factors such as history of blood transfusion, multiple sexual partners, tattoos/piercings, or injectable drug use were not significantly associated with infection in this study. This may reflect the young age structure of participants, underreporting of sensitive behaviors, or the relatively small number of HBV-positive cases, limiting statistical power.

Another important finding was the low uptake of HBV vaccination among participants. Despite being one of the most effective measures against HBV transmission, coverage in Nigeria remains suboptimal, especially among young adults and health-care workers (Olakunde et al., 2022Eleje et al., 2021). Only 8.3% reported being vaccinated against HBV, and among them, just 11.1% had completed the recommended three-dose series. Lack of awareness (48.7%), unavailability (18.5%), and fear of injections (7.5%) were the main barriers reported in this study. A study in Ibadan revealed that although awareness of HBV was relatively high, access to vaccination services and actual uptake remained poor (Orabueze et al., 2024; Issa et al., 2023; Chang et al., 2018). The low vaccination coverage represents major key factor that limit prevention of HBV in the studied area.

Awareness and knowledge of HBV were relatively high in this study, with over 80% of participants having heard of the infection and nearly two-thirds correctly identifying it as viral in origin. Nonetheless, misconceptions persisted: almost one in five respondents did not know the cause of HBV, and 6% incorrectly attributed transmission to food and water. Knowledge of vaccination was suboptimal, with 22% unaware of the vaccine. These findings is similar to studies among Nigerian students and healthcare trainees where awareness was moderate, but detailed knowledge remained incomplete (Atekoja et al., 2025; Nwodo et al., 2023). Importantly, gaps in knowledge may translate into low preventive uptake.

**Conclusion**

This study shows prevalence of HBV infection in this setting, with transmission primarily driven by sexual and blood-contact exposures and low vaccine uptake despite relatively high awareness levels. The clustering of infection among urban residents, sexually active individuals, and those sharing sharp objects underscores the need for targeted health education, behavioral interventions, improved access to testing and vaccination services, especially for young adults and students

Ethical approval And Consent

Ethical approval (Ref: CHSTI/CRID/25/006) was obtained from the College Research Innovation and Development Unit. written informed consent was secured from all participants, following international ethical standards for human research (World Medical Association, 2013).

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3.

**Conflict of Interest**

There was no any conflict of interest whatsoever, and every sited phrase and reference has been dully acknowledged.

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