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**Original Research Article**

# Knowledge, attitude and preventive practices of hepatitis B infection among health trainees, northern region of Ghana

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## ABSTRACT

**Background:** Hepatitis B virus (HBV) infection remains a major global health challenge, causing chronic liver diseases such as cirrhosis and hepatocellular carcinoma. Despite the availability of a safe and effective vaccine, infection rates remain high, particularly among healthcare workers and trainees. This study assessed the knowledge, attitude, and preventive practices regarding hepatitis B infection among health trainees at the University for Development Studies (UDS), Tamale, Ghana.
**Methods:** A cross-sectional study was conducted among 400 health trainees selected through stratified random sampling from six schools and faculties within the UDS Dungu Campus. Data were collected using a structured questionnaire and analysed with SPSS version 23. Descriptive statistics summarized participants' characteristics, while Chi-square and multivariable logistic regression identified factors associated with preventive practices. Statistical significance was set at $p<0.05$.
**Results:** Overall, 58.3% of participants demonstrated good knowledge of hepatitis B. Most participants (70.5%) had positive attitudes, and 70% exhibited good preventive practices. 61% of participants had received at least a dose of Hepatitis B vaccine, though only 10.5% completed post-vaccination antibody testing. Good attitude significantly predicted good practice (AOR=4.495, 95% CI: 2.613-7.731, $p<0.001$). Female students were more than twice likely to practice prevention (AOR=2.212, 95% CI: 1.262-3.877, $p=0.006$).
**Conclusions:** Health trainees demonstrated moderate knowledge and generally positive attitudes toward hepatitis B prevention. However, gaps in screening, post-vaccination testing, and exposure reporting indicate the need for strengthened health education and institutional vaccination programmes in Ghana.

**Keywords:** Hepatitis B, Health trainees, Ghana

## INTRODUCTION

Hepatitis B infection is a major viral disease that remains a significant global public health concern due to its association with acute and chronic liver conditions such as cirrhosis, liver failure, and hepatocellular carcinoma.[1,2] The virus is transmitted mainly through exposure to infected blood and bodily fluids, including sexual contact, mother-to-child transmission, and sharing of sharp objects such as needles and blades.[3,4] Hepatitis B is highly

infectious, being approximately 50-100 times more transmissible than HIV, thereby increasing the risk of infection in both healthcare and community settings.[5-7] The disease has an average incubation period of 90 days, and because many infected persons remain asymptomatic, transmission and liver damage may continue unnoticed for years.[5,8]

Globally, an estimated 304 million people were living with chronic hepatitis B or C in 2022, with hepatitis B accounting for over 80% of the burden.[9] In the same year, hepatitis-related diseases caused approximately 1.3 million deaths despite the availability of effective preventive interventions.[2,10] The burden is particularly high in low- and middle-income countries, especially in sub-Saharan Africa, where between 9% and 20% of the population is chronically infected.[2,11] In Africa alone, about 65 million people live with chronic hepatitis B, with nearly 1.1 million deaths occurring annually from complications such as cirrhosis and liver cancer.[10,12] In Ghana, hepatitis B remains endemic, with a national prevalence of 9% reported in 2022.[9]

Healthcare workers and trainees are among the most vulnerable groups due to frequent exposure to blood, body fluids, and contaminated materials.[13] This vulnerability is heightened among trainees who may lack adequate practical experience and infection-prevention training.[14] Studies among tertiary students have reported varying levels of knowledge and preventive practices. In Sudan, although 54.9% of tertiary students demonstrated good knowledge, 56.2% still showed poor preventive practices.[14] Similarly, a study in Tanzania reported low knowledge levels among tertiary students.[3] Since hepatitis B has no permanent cure, prevention through vaccination remains the most effective strategy.[8,13] However, vaccination uptake among health trainees remains inconsistent despite their increased occupational risk.[13,14]

University students are also at risk due to behaviours such as unprotected sex, body piercing, tattooing, and substance use.[4,15] In Gabon, a study reported a 5.6% prevalence of hepatitis B surface antigen among tertiary students, highlighting the growing public health concern.[16] Although some studies have reported fair knowledge and positive attitudes toward hepatitis B prevention, adherence to preventive practices remains inadequate.[4,17] These findings underscore the need for continuous education, regular screening, routine vaccination, and adherence to infection-prevention measures among health trainees and university students.[12,13]

Adequate knowledge among health trainees is essential because poor awareness may contribute to unsafe practices, delayed diagnosis, and continued transmission of the disease, particularly as hepatitis B can remain asymptomatic for several years while progressively damaging the liver.[5] Regular screening and testing are therefore important for early detection, treatment, and prevention of transmission.[8] This study, therefore, aimed to assess the knowledge, attitude, and preventive practices regarding hepatitis B infection among health trainees at the University for Development Studies.

## METHODS

### *Study area, design, and population*

This study was conducted at the University for Development Studies (UDS) in the Tamale Metropolis, situated in the Northern Region of Ghana. Situated about 600 kilometres north of Accra, Tamale stands as the administrative, commercial, and educational nucleus of Northern Ghana. This research was conducted specifically at the Dungu Campus, which shares boundaries with Datoyili and Lamashegu. The campus hosts five health-related schools and two faculties, including the School of Medicine, School of Allied Health Sciences, School of Nursing and Midwifery, School of Public Health, School of Pharmacy and Pharmaceutical Sciences, Faculty of Sustainable Development Studies, and Faculty of Education. The study targeted only health trainees enrolled in the health-related schools.

A quantitative, institutional-based cross-sectional study was conducted from January 2024 to March 2024 at the University for Development Studies (UDS), Dungu Campus, in the Tamale Metropolis, Northern Region of Ghana. This design enabled the assessment of knowledge, attitude, and practices related to hepatitis B infection and vaccination among health trainees using structured questionnaires [18]. The study population included all health trainees at the Dungu Campus. These students were drawn from the five health-related schools, excluding those in the non-health faculties. The inclusion criteria comprised male and female health trainees at all levels of study who voluntarily agreed to participate by signing the consent form. Students who were not pursuing health-related programmes or those unwilling to provide consent were excluded from participation.

### *Sample size determination and technique*

The Cochran formula for cross-sectional design was used to determine the sample size. The Cochran formula was: $n = Z^2 \times P(1-P)/d^2$, where n was the sample size, Z was the z-score (1.96), P was the estimated prevalence in the study area, and d was the margin of error at 5% (0.05). Using a margin of error (0.05), critical value at 95% confidence level (1.96), and the prevalence of trainee nursing students fully vaccinated with the Hepatitis B vaccine was 59.5% in a study conducted in Upper East.[17]

$$n = Z^2 \times P(1-P)/d^2$$

$$n = 1.96^2 \times 0.595(1-0.595)/ 0.05^2$$

$$n = 3.8416 \times 0.240975/ 0.0025$$

n = 370

Adding 5% as a non-response rate, the minimal estimated sample size for this study was 389 participants.

A stratified random sampling technique was adopted to select respondents in order to enhance representativeness and minimise selection bias. Stratification was done according to the programme of study and level of academic year, ensuring that every category of health trainee was adequately represented. In total, five (5) strata were established, corresponding to the various schools and faculties within the Dungu Campus that host health-related programmes namely, the School of Medicine, School of Allied Health Sciences, School of Nursing and Midwifery, School of Public Health, and School of Pharmacy and Pharmaceutical Sciences.

Within each stratum, participants were selected using the lottery method, which provided a practical and transparent form of simple random sampling. Lists of eligible students were compiled for each programme and academic level with the assistance of class representatives. The identification numbers of eligible students present at the time of data collection were written on separate slips of paper according to their respective strata. These slips were folded, placed in a container, and thoroughly mixed to ensure a random distribution. The researchers, assisted by a class representative, randomly picked slips from each stratum in alternating turns until the overall target sample size was achieved. Each slip picked represented a student who was automatically included in the study. The process was repeated independently for every school and academic level until the total predetermined sample size was achieved.

This approach provided every eligible student with an equal chance of being selected while ensuring that the distribution across schools reflected their actual population sizes. The lottery method was considered appropriate because it is simple, unbiased, and replicable, thereby strengthening the credibility and representativeness of the sample.

***Data collection procedure and instrument***

Data were collected using a structured questionnaire adapted from previously validated and ethically approved studies.[17,19,20] The instrument consisted mainly of closed-ended questions and was pretested to ensure clarity, relevance, and reliability. The questionnaire captured socio-demographic characteristics, knowledge, attitudes, screening/testing behaviours, and preventive practices regarding hepatitis B infection.

Knowledge was assessed using 18 questions covering causes, symptoms, transmission, diagnosis, management, complications, vaccination, and post-exposure prophylaxis. Correct answers were scored "1" and incorrect answers "0," with composite scores categorised as poor (0-14) or good (15-18) knowledge. Attitudes were assessed using eight Likert-scale items, with scores categorised as poor (0-6) or good (7-8). Preventive practices, including vaccination status, infection prevention measures, and exposure to blood or body fluids, were similarly scored and categorised as poor (0-6) or good (7-8) practice. Detailed scoring criteria were provided in Supplementary Sheet 1.

Permission for the study was obtained from the Dean of Students at the University for Development Studies. Participation was voluntary, informed consent was obtained, and completed questionnaires were checked for completeness immediately after collection.

***Reliability and validity of the instrument***

Content validity of the questionnaire was ensured through an extensive review of relevant literature and previously validated instruments on hepatitis B knowledge, attitudes, and practices among health trainees.[17,19-21] The items were aligned with the study objectives and reviewed by two public health researchers and a senior lecturer in health education at the University for Development Studies to improve clarity, relevance, and wording. Their feedback guided revisions and strengthened the content and face validity of the instrument.

Reliability was assessed through a pretest involving 10% of the intended sample (39 students) at Tamale Nursing and Midwifery Training College. The pretest helped identify and revise unclear or ambiguous questions. Internal consistency was measured using Cronbach's alpha, yielding values of 0.705 for the 18-item knowledge scale and 0.730 for the 8-item attitude scale, indicating acceptable reliability. Overall, the questionnaire was considered clear, valid, and reliable for the study.

***Data analysis plan***

Data collected were first checked for completeness and consistency before entry into the Statistical Package for Social Sciences (SPSS) version 23 for analysis. Both descriptive and inferential statistical methods were employed in line with the study objectives. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarise respondents' demographic characteristics as well as their levels of knowledge, attitudes, and practices regarding hepatitis B infection and vaccination. The results were presented using tables, graphs, and charts for clarity and easy interpretation.

Inferential statistics were applied to assess associations between selected independent variables and key outcome variables using bivariate analysis (Chi-square analysis). Multivariable logistic regression analysis was further conducted to determine predictors of hepatitis B preventive practices while controlling for potential

confounding variables. Adjusted odds ratios (AOR) with their 95% confidence intervals were calculated, and variables with a p-value less than 0.05 were considered statistically significant.

### *Ethical consideration*

Ethical approval for the study was obtained from the University for Development Studies Ethical Review Board before data collection. Permission was also sought from the Heads of Departments of the various schools and faculties. The study protocol was reviewed with the research supervisor to ensure adherence to ethical principles, including informed consent, anonymity, and confidentiality. Participants were informed about the purpose and relevance of the study before data collection, and verbal consent was obtained. Participation was voluntary, and respondents could withdraw at any time without consequences. Privacy and confidentiality of participants' information were strictly maintained throughout the study.

## RESULTS

A total of 400 participants were included in the study (Table 1). The majority of respondents (59.0%) were aged 20-24 years, and most participants were single (68.5%). Females constituted a slight majority (54.5%) compared to males (45.5%). It was revealed that most students were offered in nursing (20.5%) and medical laboratory (19.3%), while very few of them (7.3%) were public health students. About 33% of them were in their third year, and 12.8% were currently employed during the period of data collection.

Among the 400 participants, 58.3% demonstrated good overall knowledge of hepatitis B. It was revealed that most respondents (62.7%) knew that asymptomatic carriers can still transmit the infection. The majority recognised jaundice as a symptom (58.2%) and identified contaminated blood and unsterilized instruments as key transmission routes (61.8% and 65.0%, respectively) (Table 2).

**Table 1: Socio-demographic characteristics of health trainees (n=400).**

| Variables | Category | Frequency | Percent |
|---|---|---|---|
| **Age (in years)** | 15-19 | 29 | 7.3 |
| | 20-24 | 236 | 59.0 |
| | 25-30 | 97 | 24.3 |
| | 30 + | 38 | 9.5 |
| **Marital status** | Cohabiting | 16 | 4.0 |
| | Married | 110 | 27.5 |
| | Single | 274 | 68.5 |
| **Sex** | Female | 218 | 54.5 |
| | Male | 182 | 45.5 |
| **Ethnicity** | Akan | 113 | 28.3 |
| | Dagaba | 38 | 9.5 |
| | Dagomba | 146 | 36.5 |
| | Frara | 34 | 8.5 |
| | Gonja | 47 | 11.8 |
| | Others (specify) | 22 | 5.5 |
| **Religion** | Christian | 159 | 39.8 |
| | Muslim | 232 | 58.0 |
| | Traditionalist | 9 | 2.3 |
| **Program of study** | Medical laboratory | 77 | 19.3 |
| | Medicine | 60 | 15.0 |
| | Midwifery | 55 | 13.8 |
| | Nursing | 82 | 20.5 |
| | Nutrition | 50 | 12.5 |
| | Pharmacy | 47 | 11.8 |
| | Public health | 29 | 7.3 |
| **Current level of study** | Year one | 32 | 8.0 |
| | Year two | 107 | 26.8 |
| | Year three | 131 | 32.8 |
| | Year four | 111 | 27.8 |
| | Year five | 19 | 4.8 |
| **Employment status** | Employed | 51 | 12.8 |
| | Unemployed | 349 | 87.3 |

Continued.

| Variables | Category | Frequency | Percent |
|---|---|---|---|
| **Region** | Ahafo | 11 | 2.8 |
| | Ashanti | 42 | 10.5 |
| | Bono | 12 | 3.0 |
| | Bono east | 2 | 0.5 |
| | Central | 15 | 3.8 |
| | Eastern | 5 | 1.3 |
| | Greater Accra | 72 | 18.0 |
| | North east | 9 | 2.3 |
| | Northern | 144 | 36.0 |
| | Oti | 2 | 0.5 |
| | Savannah | 28 | 7.0 |
| | Upper east | 24 | 6.0 |
| | Upper west | 12 | 3.0 |
| | Volta | 4 | 1.0 |
| | Western | 15 | 3.8 |
| | Western north | 3 | 0.8 |
| **Place of residence** | Rural | 200 | 50.0 |
| | Urban | 200 | 50.0 |
| **Category of students** | Regular | 350 | 87.5 |
| | Sandwich | 11 | 2.8 |
| | Top-up | 39 | 9.8 |
| **Source of funding** | Husband/wife | 54 | 13.5 |
| | Parents | 233 | 58.3 |
| | Relatives | 47 | 11.8 |
| | Scholarship | 18 | 4.5 |
| | Self | 48 | 12.0 |

**Table 2: Knowledge of Hepatitis B infection among health trainees (n=400).**

| Variables/questions | Response | Frequency | Percent |
|---|---|---|---|
| **Knowledge score** | Poor | 167 | 41.7 |
| | Good | 233 | 58.3 |
| **Causes** | Hepatitis B is caused by a dsDNA virus | | |
| | Yes | 229 | 57.2 |
| | Not sure | 104 | 26.0 |
| | No | 67 | 16.8 |
| **Clinical manifestation** | Jaundice is a symptom of hepatitis B infection | | |
| | Yes | 233 | 58.2 |
| | Not sure | 136 | 34.0 |
| | No | 31 | 7.8 |
| | Not all hepatitis B infected people present with symptoms | | |
| | Yes | 172 | 43.0 |
| | Not sure | 145 | 36.3 |
| | No | 83 | 20.7 |
| **Signs/symptoms** | Asymptomatic carriers can transmit hepatitis B | | |
| | Yes | 251 | 62.7 |
| | Not sure | 93 | 23.3 |
| | No | 56 | 14.0 |
| **Route of transmission** | Transmitted via the faeco-oral route | | |
| | Yes | 204 | 51.0 |
| | Not sure | 142 | 35.5 |
| | No | 54 | 13.5 |
| | Transmitted through casual contact (e.g., holding hands) | | |
| | Yes | 191 | 47.8 |

Continued.

| Variables/questions | Response | Frequency | Percent |
|---|---|---|---|
| | Not sure | 114 | 28.4 |
| | No | 95 | 23.8 |
| | Transmitted through contaminated blood and blood products | | |
| | Yes | 247 | 61.8 |
| | Not sure | 113 | 28.2 |
| | No | 40 | 10.0 |
| | Transmitted via unsterilized syringes, needles, and instruments | | |
| | Yes | 260 | 65.0 |
| | Not sure | 101 | 25.3 |
| | No | 39 | 9.7 |
| | Transmitted via unprotected sex | | |
| | Yes | 223 | 55.8 |
| | Not sure | 125 | 31.2 |
| | No | 52 | 13.0 |
| | Mother-to-child transmission at birth | | |
| | Yes | 219 | 54.8 |
| | Not sure | 138 | 34.4 |
| | No | 43 | 10.8 |
| **Means of diagnosis** | Diagnosed by serological Rapid Diagnostic Test | | |
| | Yes | 179 | 44.7 |
| | Not sure | 183 | 45.8 |
| | No | 38 | 9.5 |
| | Diagnosed by molecular test | | |
| | Yes | 171 | 42.7 |
| | Not sure | 176 | 44.0 |
| | No | 53 | 13.3 |
| **Management/treatment** | Hepatitis B infection is curable | | |
| | Yes | 219 | 54.7 |
| | Not sure | 97 | 24.3 |
| | No | 84 | 21.0 |
| **Complications** | Hepatitis B virus can cause liver cancer | | |
| | Yes | 257 | 64.2 |
| | Not sure | 109 | 27.3 |
| | No | 34 | 8.5 |
| **Vaccination** | Hepatitis B vaccine is made from human blood | | |
| | Yes | 137 | 34.2 |
| | Not sure | 142 | 35.5 |
| | No | 121 | 30.3 |
| | Hepatitis B vaccination prevents infection | | |
| | Yes | 270 | 67.5 |
| | Not sure | 100 | 25.0 |
| | No | 30 | 7.5 |
| | Hepatitis B vaccine protects against liver cancer | | |
| | Yes | 198 | 49.5 |
| | Not sure | 148 | 37.0 |
| | No | 54 | 13.5 |
| **Post-exposure prophylaxis** | Hepatitis B infection has post-exposure prophylaxis | | |
| | Yes | 184 | 46.0 |
| | Not sure | 184 | 46.0 |
| | No | 32 | 8.0 |
| **Yes = 1; "No and Not Sure" = 0** | | | |

It was revealed that the majority (70.5%) demonstrated a good attitude towards hepatitis B infection. Most respondents (49.5%) agreed they were at risk of infection, while over half (51.0%) disagreed that occasional contact with blood increases risk (Table 3).

The overall practice towards hepatitis B infection prevention was good, with 70% of participants scoring well (Table 4). Screening for hepatitis B was low, as 66% had never been tested, mostly due to lack of reason or financial constraints. Vaccination uptake was higher, with 61% vaccinated with at least a dose of Hepatitis B vaccine and nearly half of them completing three doses, though only 10.5% had post-vaccination antibody testing (Table 5).

**Table 2: Attitude towards Hepatitis B infection among health trainees (n=400).**

| Variables | Frequency | Percent |
|---|---|---|
| **Attitude score** | | |
| Poor | 118 | 29.5 |
| Good | 282 | 70.5 |
| **You are at risk of getting Hepatitis B infection** | | |
| Strongly disagree | 19 | 4.8 |
| Disagree | 55 | 13.8 |
| Uncertain | 66 | 16.4 |
| Agree | 198 | 49.5 |
| Strongly agree | 62 | 15.5 |
| **Occasional contact with blood will not necessarily increase my risk of getting Hepatitis B infection** | | |
| Strongly disagree | 54 | 13.5 |
| Disagree | 204 | 51.0 |
| Uncertain | 57 | 14.2 |
| Agree | 55 | 13.8 |
| Strongly agree | 30 | 7.5 |
| **Wearing personal protective equipment during surgery is unnecessary** | | |
| Strongly disagree | 83 | 20.8 |
| Disagree | 158 | 39.5 |
| Uncertain | 57 | 14.2 |
| Agree | 71 | 17.8 |
| Strongly agree | 31 | 7.8 |
| **Hepatitis B vaccination is unnecessary because acquiring Hepatitis B infection is not as serious as HIV infection** | | |
| Strongly disagree | 73 | 18.2 |
| Disagree | 142 | 35.5 |
| Uncertain | 80 | 20.0 |
| Agree | 82 | 20.5 |
| Strongly agree | 23 | 5.8 |
| **Hepatitis B infection is not potentially serious because people who acquire it live normal lives** | | |
| Strongly disagree | 69 | 17.2 |
| Disagree | 155 | 38.8 |
| Uncertain | 73 | 18.2 |
| Agree | 79 | 19.8 |
| Strongly agree | 24 | 6.0 |
| **Hepatitis B infection is not potentially serious because it is treatable** | | |
| Strongly disagree | 60 | 15.0 |
| Disagree | 146 | 36.5 |
| Uncertain | 96 | 24.0 |
| Agree | 69 | 17.3 |
| Strongly agree | 29 | 7.3 |
| **Occasional needle pricks don't require reporting to the healthcare authorities** | | |
| Strongly disagree | 64 | 16.0 |
| Disagree | 130 | 32.5 |
| Uncertain | 94 | 23.5 |
| Agree | 83 | 20.7 |
| Strongly agree | 29 | 7.3 |
| **Occasional blood or body fluid splashes on the face don't require any reporting** | | |
| Strongly disagree | 69 | 17.3 |
| Disagree | 155 | 38.7 |

Continued.

| Variables | Frequency | Percent |
|---|---|---|
| Uncertain | 78 | 19.5 |
| Agree | 68 | 17.0 |
| Strongly agree | 30 | 7.5 |

**Table 3: Preventive practices regarding Hepatitis B infection among health trainees (n=400).**

| Variables | Response | Frequency | Percent |
|---|---|---|---|
| **Practice score** | Poor | 120 | 30.0 |
| | Good | 280 | 70.0 |
| **Screened/tested for Hepatitis B** | No | 264 | 66.0 |
| | Yes | 136 | 34.0 |
| **Last time you got tested** | Less than a year ago | 49 | 36.0 |
| | More than a year ago | 87 | 64.0 |
| **If no, reason for not screening/testing** | Do not have money | 48 | 18.2 |
| | Do not have time | 16 | 6.1 |
| | Do not know where to go for it | 27 | 10.2 |
| | Don't have any reason | 120 | 45.5 |
| | Fear of positive test results | 53 | 20.1 |

**Table 4: Preventive practices regarding Hepatitis B infection among health trainees (n=400).**

| Variables | Response | Frequency | Percent |
|---|---|---|---|
| **Taken the hepatitis B vaccine** | No | 156 | 39.0 |
| | Yes | 244 | 61.0 |
| **If yes, how many doses of hepatitis B vaccine have you received?** | > 3 doses | 13 | 5.3 |
| | 1 dose | 31 | 12.7 |
| | 2 doses | 82 | 33.6 |
| | 3 doses | 118 | 48.4 |
| **Done a post hepatitis B vaccination antibody test** | No | 358 | 89.5 |
| | Yes | 42 | 10.5 |
| **Do you change gloves for each patient during blood collection?** | Always | 234 | 58.5 |
| | Never | 16 | 4.0 |
| | Sometimes | 150 | 37.5 |
| **Recap needles after use** | Always | 235 | 58.8 |
| | Never | 31 | 7.8 |
| | Sometimes | 134 | 33.5 |
| **To the best of your knowledge, have you acquired needle stick injuries in the past?** | Always | 31 | 7.8 |
| | Never | 217 | 54.3 |
| | Sometimes | 152 | 38.0 |
| **To the best of your knowledge, have you splashed blood/body fluids on your body?** | Always | 35 | 8.8 |
| | Never | 263 | 65.8 |
| | Sometimes | 102 | 25.5 |
| **If no, which of the following was your reason for not taken the vaccine?** | Am not sick | 23 | 14.7 |
| | Do not believe in the importance of the vaccine | 6 | 3.8 |
| | Do not have money | 57 | 36.5 |
| | Do not have time | 11 | 7.1 |
| | Do not know where to access it | 11 | 7.1 |
| | Don't have any reason | 45 | 28.8 |
| | I am unaware of vaccine availability | 3 | 1.9 |
| **Will you be willing to take the vaccine if it is offered for free?** | No | 59 | 37.8 |
| | Yes | 97 | 62.2 |

The study reveals that several variables were significantly associated with hepatitis B preventive practice in a chi-square analysis (Table 6). Age of participants showed a significant association ($p<0.001$), with students aged 20-

24 (74.6%) and 25-30 (71.1%) demonstrating higher proportions of good practice compared to those aged 31 and above (42.1%). Marital status was also significant (p<0.001), where single students (77.0%) exhibited better preventive practice than married (59.1%) and cohabiting students (25.0%). Sex was another significant variable (p=0.012), with female students showing a higher good practice (75.2%) than males (63.7%). Attitude also had a strong association (p<0.001), where students with a good attitude exhibited markedly higher good practice (81.2%) compared to those with a poor attitude (43.2%).

**Table 5: Factors associated with practices of Hepatitis B infection prevention among health trainees (n=400).**

| Variables | Poor practice | Good practice | P value |
|---|---|---|---|
| **Age group in years** | | | |
| 15-19 | 10 (34.5) | 19 (65.5) | <0.001 |
| 20-24 | 60 (25.4) | 176 (74.6) | |
| 25-30 | 28 (28.9) | 69 (71.1) | |
| 31+ | 22 (57.9) | 16 (42.1) | |
| **Marital status** | | | |
| Single | 63 (23.0) | 211 (77.0) | <0.001 |
| Married | 45 (40.9) | 65 (59.1) | |
| Cohabiting | 12 (75.0) | 4 (25.0) | |
| **Sex** | | | |
| Male | 66 (36.3) | 116 (63.7) | 0.012 |
| Female | 54 (24.8) | 164 (75.2) | |
| **Ethnicity** | | | |
| Dagomba | 30 (20.5) | 116 (79.5) | <0.001 |
| Dagaba | 19 (50.0) | 19 (50.0) | |
| Akan | 39 (34.5) | 74 (65.5) | |
| Gonja | 9 (19.1) | 38 (80.9) | |
| Frafra | 16 (47.1) | 18 (52.9) | |
| Others | 7 (31.8) | 15 (68.2) | |
| **Religion** | | | |
| Christian | 58 (36.5) | 101 (63.5) | <0.001 |
| Muslim | 54 (23.3) | 178 (76.7) | |
| Traditional | 8 (88.9) | 1 (11.1) | |
| **Program of study** | | | |
| Nursing | 29 (35.4) | 53 (64.6) | 0.598 |
| Midwifery | 14 (25.5) | 41 (74.5) | |
| Nutrition | 16 (32.0) | 34 (68.0) | |
| Medical laboratory | 20 (26.0) | 57 (74.0) | |
| Public health | 12 (41.4) | 17 (58.6) | |
| Medicine | 16 (26.7) | 44 (73.3) | |
| Pharmacy | 13 (27.7) | 34 (72.3) | |
| **Level of study** | | | |
| Year one | 16 (50.0) | 16 (50.0) | 0.063 |
| Year two | 34 (31.8) | 73 (68.2) | |
| Year three | 38 (29.0) | 93 (71.0) | |
| Year four | 29 (26.1) | 82 (73.9) | |
| Year five | 3 (15.8) | 16 (84.2) | |
| **Employment status** | | | |
| Employed | 18 (35.3) | 33 (64.7) | 0.377 |
| Unemployed | 102 (29.2) | 247 (70.8) | |
| **Place of residence** | | | |
| Urban | 59 (29.5) | 141 (70.5) | 0.827 |
| Rural | 61 (30.5) | 139 (69.5) | |
| Category of student | | | |
| Regular | 99 (28.3) | 251 (71.7) | 0.021 |
| Top-up | 19 (48.7) | 20 (51.3) | |
| Sandwich | 2 (18.2) | 9 (81.8) | |

Continued.

| Variables | Poor practice | Good practice | P value |
|---|---|---|---|
| **Source of funding for education** | | | |
| Self | 22 (45.8) | 26 (54.2) | 0.153 |
| Parents | 65 (27.9) | 168 (72.1) | |
| Husband/wife | 14 (25.9) | 40 (74.1) | |
| Relative | 14 (29.8) | 33 (70.2) | |
| Scholarship | 5 (27.8) | 13 (72.2) | |
| **Level of knowledge** | | | |
| Poor knowledge | 56 (33.5) | 111 (66.5) | 0.192 |
| Good knowledge | 64 (27.5) | 169 (72.5) | |
| **Attitude** | | | |
| Poor attitude | 67 (56.8) | 51 (43.2) | <0.001 |
| Good attitude | 53 (18.8) | 229 (81.2) | |

**Table 6: Factors influencing good practices of Hepatitis B infection prevention among health trainees (n=400).**

| Variables | Good practices of Hepatitis B infection prevention | | | |
|---|---|---|---|---|
| | AOR | 95% C.I. | | P value |
| | | Lower | Upper | |
| **Age group in years** | | | | |
| 15-19 | Ref | | | |
| 20-24 | 1.605 | 0.617 | 4.175 | 0.332 |
| 25-30 | 2.701 | 0.849 | 8.597 | 0.092 |
| 31+ | 1.043 | 0.272 | 4.000 | 0.952 |
| **Marital status** | | | | |
| Single | Ref | | | |
| Married | 0.402 | 0.196 | 0.826 | 0.013* |
| Cohabiting | 0.253 | 0.071 | 0.901 | 0.034* |
| **Sex** | | | | |
| Male | Ref | | | |
| Female | 2.212 | 1.262 | 3.877 | 0.006* |
| **Ethnicity** | | | | |
| Dagomba | Ref | | | |
| Dagaba | 0.228 | 0.084 | 0.625 | 0.004* |
| Akan | 0.442 | 0.211 | 0.926 | 0.031* |
| Gonja | 0.876 | 0.325 | 2.363 | 0.794 |
| Frafra | 0.218 | 0.081 | 0.585 | 0.002* |
| Others | 0.306 | 0.100 | 0.935 | 0.038* |
| **Religion** | | | | |
| Christian | Ref | | | |
| Muslim | 0.833 | 0.441 | 1.574 | 0.573 |
| Traditional | 0.142 | 0.016 | 1.276 | 0.082 |
| **Category of student** | | | | |
| Regular | Ref | | | |
| Top-up | 0.521 | 0.206 | 1.316 | 0.168 |
| Sandwich | 2.055 | 0.369 | 11.445 | 0.411 |
| **Attitude** | | | | |
| Poor attitude | Ref | | | |
| Good attitude | 4.495 | 2.613 | 7.731 | <0.001* |

*Statistically significant

The study revealed a few factors significantly associated with good practice towards Hepatitis B infection prevention (Table 7). Students with a good attitude were about 4.5 times more likely to demonstrate good preventive practices compared to those with a poor attitude (AOR=4.495, 95% CI: 2.613-7.731, p<0.001). Married students were about 60% less likely, and cohabiting students about 75% less likely to exhibit good practice compared to single students (AOR=0.402, 95% CI: 0.196-0.826, p=0.013; AOR=0.253, 95% CI: 0.071-

0.901, p=0.034, respectively). Female students had over twice the odds of good practice compared to males (AOR=2.212, 95% CI: 1.262-3.877, p=0.006).

## DISCUSSION

The study revealed that 58.3% of participants demonstrated good overall knowledge of hepatitis B, indicating a moderate but promising awareness among tertiary students. This aligns with Babiker et al in Sudan, who found 54.9% of students had good knowledge, and with Vake in Zambia, where awareness reached 88%, although the latter's higher level likely reflects broader vaccination campaigns and health education exposure.[14,22] The present findings also correspond with Villiers et al, who described both vertical and horizontal HBV transmission through contaminated blood and bodily fluids, consistent with the 61.8% and 65.0% of students here identifying those routes.[23] Similarly, Alhassan et al reported high recognition of sexual intercourse, blood transfusion, and childbirth as transmission modes among nursing students in Ghana.[24] However, the relatively limited understanding of sexual transmission noted by Egbe et al and Ojurongbe et al in Nigeria contrasts with this study's findings, suggesting that Ghanaian students may benefit from more structured academic health education.[25,26] The consistent recognition of asymptomatic transmission (62.7%) and jaundice as a symptom (58.2%) reflects ongoing public health messaging, though the moderate knowledge of post-exposure prophylaxis (46.0%) echoes Tawiah et al, who found incomplete understanding of occupational exposure management among laboratory students.[7] This gap highlights the need for curricular emphasis on post-exposure actions and routine refresher training.

The observed knowledge level in this study may be influenced by several contextual factors. As tertiary-level health trainees, many participants are likely exposed to hepatitis B-related information through formal coursework in areas such as microbiology, public health, and clinical sciences, which may account for the relatively high awareness of key transmission routes. Additionally, ongoing public health education and vaccination campaigns in Ghana, particularly within academic and healthcare settings, may have contributed to awareness of symptoms and asymptomatic transmission. Clinical exposure during training, including hospital-based practical sessions, may further reinforce understanding of occupational risk. However, the comparatively lower knowledge of post-exposure prophylaxis suggests possible gaps in curriculum depth, inconsistent emphasis on exposure management across programmes, or limited refresher training, thereby contributing to the overall moderate knowledge level observed.

Regarding prevention, 67.5% of participants identified vaccination as protective and nearly half (49.5%) associated it with reduced liver cancer risk, showing awareness of long-term complications. These results mirror Almalki et al and Hernandez et al, who observed high vaccination knowledge and willingness among students in Saudi Arabia and Ghana.[27,8] Yet, practical gaps persist, with only 10.5% reported post-vaccination antibody testing, resonating with Tamanna et al in Bangladesh, who found similar shortfalls despite satisfactory vaccine uptake.[28] This implies that knowledge alone does not ensure comprehensive preventive behaviour without institutional follow-up systems.

Attitudes toward HBV prevention were largely positive, with 70.5% demonstrating good attitudes and 49.5% acknowledging personal risk, comparable to the 68.1% fair attitudes reported by Babiker et al and the 82% positive attitude in Vake.[14,22] However, the finding that 51% underestimated infection risk from occasional blood contact indicates cognitive dissonance between knowledge and perceived vulnerability. Unlike Aynalem et al in Ethiopia, who found no significant link between attitude and practice, this study showed students with good attitudes were 4.5 times more likely to engage in preventive measures, aligning with Tamanna et al, who confirmed a strong attitude–practice relationship.[29,28] These variations may arise from contextual factors such as institutional infection-control policies, peer influence, or differing access to resources.

The overall preventive practice was good (70%), yet screening remained low (34%), mainly due to financial barriers and lack of perceived need. This mirrors Gyimah et al and Egbe et al, who cited cost and low motivation as barriers to screening.[30,25] In contrast, Okwan et al found higher screening rates (76.4%) in Ashanti, highlighting regional disparities in access.[31] Vaccination coverage in this study (61%) was higher than Amedonu et al and Gyimah et al but lower than global findings by Almalki et al and Hernandez et al, implying that logistical and financial challenges still hinder universal vaccination among students.[32,30,27,8] Needle-stick injuries and blood splashes, reported by 38% and 8.8%, respectively, are consistent with Tawiah et al, highlighting persistent occupational exposure risks despite awareness.[7]

Sociodemographic differences were significant: females had twice the odds of good practice, reflecting gendered health consciousness also observed by Babiker et al.[14] This may be related to women's generally higher engagement with preventive health behaviours, greater responsiveness to health education, and more frequent interaction with healthcare services, which collectively enhance risk awareness and compliance with recommended practices.

While married and cohabiting students were less likely to practice preventive measures, this pattern may be explained by several interrelated factors. Married or cohabiting students often face competing time demands related to family responsibilities, childcare, and

household obligations, which may reduce their ability to consistently engage in preventive practices such as vaccination follow-up or routine health screening. Additionally, individuals within stable relationships may perceive themselves to be at lower risk of infection, particularly for sexually transmitted infections, leading to reduced motivation to adopt preventive behaviours. Shared decision-making within family units, financial constraints, and prioritisation of family needs over personal health may further contribute to lower preventive practice.

These findings have implications for designing targeted interventions that consider both gender and marital status to optimise preventive behaviour uptake. Tailored health education strategies that address risk perception among married and cohabiting students, emphasise continued vulnerability despite relationship status, and accommodate time constraints through flexible or institution-based preventive services may improve practice levels in this group.

Despite the strengths of this study, certain limitations should be acknowledged. The cross-sectional design limits the ability to establish causal relationships between knowledge, attitudes, and preventive practices, as data were collected at a single point in time. Additionally, the reliance on self-reported information may introduce recall bias or social desirability bias, potentially leading to overestimation of positive behaviours such as vaccination uptake and preventive practices. The study was conducted among health trainees within a single tertiary campus, which may limit the generalisability of the findings to non-health students or to tertiary institutions in other regions. Furthermore, variations in curriculum content and clinical exposure across programmes were not independently assessed, which may have influenced differences in knowledge and practice. Notwithstanding these limitations, the study provides valuable insights into hepatitis B knowledge, attitudes, and preventive behaviours among health trainees and highlights critical areas for targeted interventions.

## CONCLUSION

The study demonstrated that while most tertiary students possessed good knowledge, positive attitudes, and commendable preventive practices toward hepatitis B, notable gaps remain in critical areas such as screening, post-vaccination antibody testing, and post-exposure management. The findings revealed that despite moderate awareness of transmission routes and preventive measures, behavioural inconsistencies, such as limited testing and occasional unsafe practices, persist, often influenced by financial barriers and low perceived risk. Attitude emerged as a strong predictor of good practice, with females generally demonstrating higher compliance, while married and cohabiting students showed lower engagement in preventive behaviours. These insights highlight the need for targeted institutional interventions, including strengthened health education, free or subsidised vaccination and screening services, and emphasis on occupational safety training. Promoting sustained positive attitudes and improving access to preventive resources are essential to enhance hepatitis B control and safeguard the health of tertiary students in Ghana.

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## REFERENCES

1. Angelo AA, Teketelew BB, Berta DM, Chane E, Cherie N, Nigus M, et al. Knowledge, attitude, and practices towards hepatitis infection and its associated factors among adults in Gondar town, northwest Ethiopia; a community-based study, 2021. J Heal Populat Nutrit. 2024;43(1):178.
2. Deku JG, Aninagyei E, Kpene GE, Bedzina I, Mensah B, Agodey IK, et al. The burden and trends of Hepatitis B virus at a government hospital in Ghana. Ghana Med J. 2025;59(2):60.
3. Erick E, Rwegoshola K, Ibrahim PM, Semvua H, Chilongola J. Incongruity between knowledge and preventive practices on hepatitis B infection among university students in Northeastern, Tanzania. East Afr Heal Res J. 2023;7(1):67.
4. Zhang Z, Chen C, Yao L, Zhang Q, Li Q, Lin Y, et al. Study on the relationship with knowledge, attitudes, and practices for prevention control of hepatitis B among university students in Hubei Province, China. Crit Publ Heal. 2025;35(1):2519772.
5. Yakudima II, Magaji Y, Abdulkarim IA. Knowledge, attitude and practice towards Hepatitis B infection of people in part of Jigawa State, Nigeria. Dutse J Pure Appl Sci 2022;8(1a):117-30.
6. Narh BL, Senoo-Dogbey VE, Akpagloh MC. Exposure to hepatitis B virus, post-exposure prophylaxis knowledge, and related factors among healthcare workers in a tertiary care military facility in Ghana: A cross-sectional analytical study. Sci Afr. 2025;28:e02768.
7. Tawiah PA, Abaka-Yawson A, Effah ES, Arhin-Wiredu K, Oppong K. Prevalence and risk factors of hepatitis B virus infection among medical laboratory science students in a Ghanaian tertiary institution. J Heal Res. 2022;36(3):442-52.

8. Hernandez OR, Moiko JK, Delis CY. Factors influencing awareness and practices of hepatitis B viral infection among students at the university for development studies in Tamale, Northern Region, Ghana. Open Access Library J. 2025;12(1):1-22.
9. World Health Organization. Viral hepatitis B and C burden of disease, WHO policy adoption status in countries, 2025. Available at: https://cdn.who.int/media/docs/default-source/hq-hiv-hepatitis-and-stis-library/2025-whd-hep-information-sheet.pdf. Accessed 01 January 2026.
10. World Health Organization. Hepatitis B, 2025. Available at: https://www.who.int/news-room/fact-sheets/detail/hepatitis-b. Accessed 01 January 2026.
11. Sticher JS, Csermak KR, Otsyula N, Turkson M, Aubrun E, Oshagbemi OA. Prevalence of viral hepatitis in sub-Saharan Africa among the general population: an umbrella review of systematic reviews and meta-analyses. BMJ open. 2025;15(9):e101029.
12. Abban E, Owusu E, Kwakye-Abebrese B, Koduah B, Boateng H, Korsah EE, et al. Knowledge and Testing of Hepatitis B Virus Infection and Vaccination Awareness among University Students in Kumasi, Ghana: A Cross-Sectional Study. Scientifica. 2024;2024(1):4052837.
13. Kumah A, Tormeti E, Dzando G, Nutakor HS, Amenuvor WA, Anagblah CK, et al. Knowledge, attitude and practices towards hepatitis B infection and vaccination among public health students in Ghana. Open J Prevent Medi. 2021;11(01):43-53.
14. Babiker LM, Idriss AI, Idriss EI, Kheirelsid FE, Idriss Sr EI. Knowledge, attitude, and practice of the medical students of the university of medical sciences and technology towards hepatitis B Virus infection. Cureus. 2025 Jul 21;17(7).
15. Debsikréo N, Mankréo BL, Moukénet A, Ouangkake M, Mara N, Moussa AM, et al. Prevalence of hepatitis B virus infection and its associated factors among students in N'Djamena, Chad. PLoS One. 2024;19(4):e0273589.
16. Mouinga-Ondeme A, Yaro M, Atome GR, Meba M, Longo-Pendy NM, Mourimarodi RM, et al. Prevalence of hepatitis B virus infection and associated factors among students living on campus in South-eastern Gabon. BMC Infect Dis. 2025;25(1):992.
17. Balegha AN, Yidana A, Abiiro GA. Knowledge, attitude and practice of hepatitis B infection prevention among nursing students in the Upper West Region of Ghana: A cross-sectional study. PloS one. 2021;16(10):e0258757.
18. Aggarwal R, Ranganathan P. Study designs: Part 2–descriptive studies. Perspect Clin Res. 2019;10(1):34.
19. Osei E, Niyilapah J, Kofi Amenuvegbe G. Hepatitis B knowledge, testing, and vaccination history among undergraduate public health students in Ghana. BioMed Res Int. 2019;2019(1):7645106.
20. Aniaku JK, Amedonu EK, Fusheini A. Assessment of knowledge, attitude and vaccination status of hepatitis B among nursing training students in Ho, Ghana. Ann Glob Heal. 2019;85(1):18.
21. Salia SM, Afaya A, Wuni A, Ayanore MA, Salia E, Kporvi DD, et al. Knowledge, attitudes and practices regarding neonatal jaundice among caregivers in a tertiary health facility in Ghana. PloS one. 2021;16(6):e0251846.
22. Vake M. Knowledge, attitude, and practices of clinical students at the Copperbelt university, school of medicine towards hepatitis b vaccination. J Hepatitis Res. 2024;8(1):1051.
23. de Villiers MJ, de Villiers E, Nayagam S, Hallett TB. Direct and indirect effects of hepatitis B vaccination in four low-and middle-income countries. Epidemics. 2024;49:100798.
24. Alhassan AR. Hepatitis B knowledge, attitude and vaccination status among nurses of Tamale Central Hospital, Ghana. Clin Res Clin Trials. 2021;3(3):1-8.
25. Egbe KA, Ike A, Egbe F. Knowledge and burden of hepatitis B virus in Nasarawa State, Nigeria. Sci African. 2023;22:e01938.
26. Ojurongbe TA, Sakeye TC, Afolabi HA, Bashiru KA, Opaleye OO, Ojurongbe O. Knowledge Attitude and Practice (KAP) of Hepatitis B (HBV) Infection among Tertiary Institution Students in the South-Western States of Nigeria. ATBU J Sci Technol Educat. 2023;10(4):446-53.
27. Almalki F, Alraffah YM, Alasiri RA, Dhafar MW, Albogami FM, Alhazmi MN, et al. Knowledge, attitude and practice towards hepatitis B infection and HBV vaccine among the healthy population in Makkah, Saudi Arabia. Infect Drug Resist. 2025:2153-64.
28. Tamanna SS, Paul KD, Al Banna MH, Zannat Z, Paul AK, Sultana S, et al. Assessment of preventive practices towards hepatitis B infection among nursing students in Bangladesh: role of knowledge, attitudes and sociodemographic factors. BMC Nursing. 2024;23(1):190.
29. Aynalem A, Deribe B, Ayalew M, Mamuye A, Israel E, Mebratu A, et al. Practice towards Hepatitis B virus infection prevention and its associated factors among undergraduate students at Hawassa University College of Medicine and Health Sciences, Hawassa, Sidama, Ethiopia, 2021: Cross-Sectional Study. Int J Hepatol. 2022;2022(1):2673740.
30. Gyimah AA, Peprah P, Agyemang-Duah W, Frimpong E, Tsiboe AK, Darkwa MA. Hepatitis B vaccination status and associated factors among university students in Ghana: A cross-sectional survey. Publ Heal Prim Heal Care. 2021;8:e2005226.
31. Okwan DK, Scott GY, Takyi P, Boateng CO, Antwi PB, Abrampah AA, et al. A multicentre cross-sectional study on Hepatitis B vaccination coverage and associated factors among personnel working in

health facilities in Kumasi, Ghana. BioMed Res Int. 2024;2024(1):8899638.
32. Amedonu EK, Aniaku JK. Assessment of high school students' knowledge, attitudes and vaccination status of hepatitis B virus in Hohoe, Ghana: A cross-sectional study. Open Publ Heal J. 2020;13(1):298-305.

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