

Original Research Article

Awareness vaccination gap in Hepatitis B among first-year MBBS students: a cross-sectional study

Rajvee S. Shah^{1*}, Aaroahi A. Acharya²

¹Department of Pharmacology, GMERS Medical College, Vadodara, Gujarat, India

²Department of Anatomy, GMERS Medical College, Vadodara, Gujarat, India

Received: 27 August 2026

Accepted: 05 October 2026

*Correspondence:

Dr. Rajvee S. Shah,

E-mail: rajvee009@gmail.com

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ABSTRACT

Background: Hepatitis B is a major infectious disease, causing liver inflammation that may progress to fibrosis, cirrhosis or hepatocellular carcinoma. This study aimed to assess the knowledge and vaccination rates for Hepatitis B among medical students, as they are at a higher occupational risk due to frequent patient contact.

Methods: A cross-sectional study was conducted in June 2025 among first-year MBBS students (academic year 2024-2025) at a medical college in Gujarat. Participants completed a structured questionnaire on hepatitis B vaccination history with documentation, modes of transmission routes and prevention, attitudes toward vaccination, reasons for non-compliance and willingness to be vaccinated.

Results: Of the 204 eligible students, 151 participated (74.0%). Most correctly identified major transmission routes, though gaps remained regarding unprotected sex, occupational exposures, tattooing and perinatal spread, with some misconceptions regarding casual contact and airborne transmission. Leading reasons for non-vaccination were lack of awareness (51.7%) and missed doses (26.5%), followed by unavailability, fear of side effects and reported allergy. Awareness for the need for hepatitis B vaccination was high (89.4%), yet only 20.0% had completed the three doses, 22.5% had received at least one dose, 40.0% were unsure of their status and nearly one-third were unvaccinated; none could provide documentation.

Conclusions: Although most students recognized the importance of Hepatitis B virus vaccination and occupational risk, a substantial proportion remained partially vaccinated or unvaccinated, with gaps in awareness regarding modes of transmission. These findings underscore the need for targeted sensitization sessions, accessible institutional vaccination programs and proper documentation of vaccination history.

Keywords: Awareness, Health education, Hepatitis B virus, Medical students, Vaccination

INTRODUCTION

Hepatitis B is a widespread infectious disease which results in inflammation of the liver. The condition can be self-limiting or can progress to liver fibrosis (scarring), cirrhosis or liver cancer. Globally, about 1.1 million people died of Hepatitis B in 2022, similar to the number of deaths caused by tuberculosis. Viral hepatitis and tuberculosis were the second leading causes of death among communicable diseases in 2022, after COVID-19. In India, as per latest estimates, 40 million people are

chronically infected with hepatitis B. It places a huge disease, social and economic burden on the affected individual, family, as well as the health system.¹ Medical students are regularly in contact with patients in the form of clinical examination, taking blood samples, assisting with minor procedures etc. The risk of acquiring hepatitis is substantial (37-62%) if one gets exposed to an infected patient without taking appropriate precautions.² The likelihood of this occurring is higher in medical students, as awareness about infection risks and preventative measures is limited.³ Despite the clinical advancements in its management, Hepatitis B infection poses a

considerable occupational risk to healthcare staff. A global meta-analysis showcased that 56.2% of healthcare workers reported experiencing needle stick injuries at some point in their careers, while 32.4% reported such incidents within the past year.⁴

The aim of this study is to evaluate the awareness, vaccination rates and documentation habits amongst first-year MBBS students, with the goal of pinpointing areas where information and vaccination compliance is lacking. Addressing these gaps will help ensure students are thoroughly informed and successfully vaccinated before they begin their clinical terms.

METHODS

Study design

A cross-sectional study was conducted in June 2025 among first-year MBBS students enrolled in the academic year 2024-2025 at GMERS Medical College, Gotri, Vadodara, India. All first-year students were explained about the study in brief and asked to fill a structured questionnaire via Google forms.

Setting

The study was conducted at GMERS Medical College, Gotri, Vadodara, India for first-year MBBS students to assess Hepatitis B immunisation.

Participants

Authors included all eligible enrolled first year medical undergraduates for the academic year 2024-2025 at our institution. Second year medical students and above and students on long-term leave or deferred enrolment during the study period (as they were not available to participate) were excluded from the study.

Study size

We decided to proceed with convenience sampling method and out of a total of 204 students, 151 voluntarily participated in the study.

Statistical methods

The data was entered using Microsoft Excel Version 16.78.3; Microsoft Corporation, Redmond, USA. The dataset was reviewed for completeness, internal consistency and any obvious entry errors before analysis. Descriptive statistics were used to summarize the dataset. Categorical variables were analysed using frequencies and percentages and results were presented in the form of tables, bar charts and pie charts. The rundown of the data was done and presented as tables and graphs. To ensure that the data collected was not repeated, the Google Forms questionnaire was limited to one response per participant. In addition, Fisher's exact test (two-sided)

was applied to assess the association between selected categorical variables where appropriate. A p-value <0.05 was considered statistically significant. No inferential statistical tests were undertaken beyond this, as the study was primarily descriptive in nature.

Ethical clearance for the study was obtained from the Institutional Ethics Committee of GMERS Medical College and Hospital, Gotri, Vadodara, India (reference number: IHEC/25/OUT/SRPG0180). Informed consent was taken through the form. Confidentiality and anonymity were maintained before data analysis.

RESULTS

Out of a total of 204 first-year MBBS students, 151 participated in the study. Ages ranged from 17 to 22 years out of which 82 were female. 89.4% students showcased awareness regarding the necessity for HBV vaccination amongst healthcare professionals. Approximately 75% of the respondents respectively believe that healthcare workers remain at an increased risk of contracting HBV infection and that it can be prevented through a complete course of vaccination. On the other hand, 54.3% believe that the chance of Hepatitis B transmission following a contaminated needle stick injury is 100 times higher as compared to HIV (Table 1).

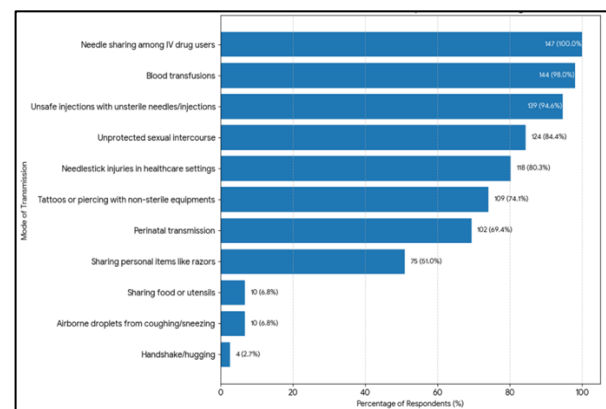


Figure 1: Awareness regarding modes of transmission.

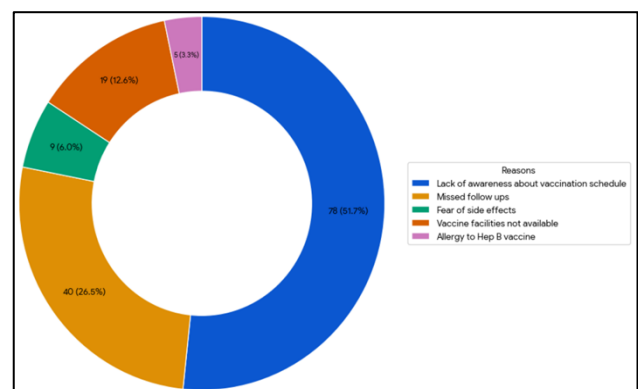


Figure 2: Reasons for not achieving (complete) immunisation (n=151).

A mere 20% students have completed the three dose primary series of immunization, while 22.5% report receiving at least one dose. Almost one-third of the cohort state that they are still unvaccinated. 40% of the students remain unsure about their immunization status. However, none of the students were able to provide documentation regarding vaccination. A statistically significant association was observed between awareness of hepatitis B vaccination and vaccination status. The proportion of fully vaccinated students was higher among those who were aware compared to those who were not aware (22.2% vs. 0.0%, $p=0.043$) (Table 2). No fully vaccinated individuals were observed among students who were not aware of hepatitis B vaccination.

The subsequent sections allowed the participants to select more than one option. Out of a total of 151 students, four participants did not answer the section regarding HBV

transmission. The majority of the students agreed that blood transfusions, needle sharing among intravenous drug users and unsafe injections with unsterile equipment are responsible for the spread of infection. Whereas, there exists a gap in awareness regarding unprotected sexual intercourse, needlestick injuries in hospitals, tattooing or piercing with non-sterile equipment and perinatal transmission as modes of transmission for Hepatitis B.

In contrast, 51% believed that sharing personal items like razors could lead to transmission, which is partially accurate. However, a small percentage (6.8%) thought that hepatitis could spread through airborne droplets from coughing or sneezing and sharing food or utensils. Notably, handshaking or hugging was selected by only 4 individuals, reflecting better awareness in that regard (Figure 1). Overall, the general awareness among students is sound, with some room for improvement.

Table 1: Participant characteristics (n=151).

Variables	Category	n=151 (%)
Gender	Male	69 (45)
	Female	82 (54.3)
Vaccination status	Fully vaccinated	30 (19.8)
	Partially vaccinated	4 (0.02)
	Unvaccinated	57 (37.7)
	Unsure	60 (39.7)
Awareness of HBV vaccination	Students who believe that healthcare workers are at a higher risk of Hepatitis B.	114 (75.5)
	Students who believe that hepatitis B is a preventable disease through a complete course of vaccination.	113 (74.8)
	Students who believe that the chance of Hepatitis B transmission following a contaminated needle stick injury is 100 times as compared to HIV.	82 (54.3)

Table 2: Association between awareness of hepatitis B vaccination and vaccination status.

Awareness	Fully vaccinated (n, %)	Not fully vaccinated (n, %)	Total	P value
Aware (n=135)	30 (22.2)	105 (77.8)	135	0.043*
Not aware (n=16)	0 (0.0)	16 (100)	16	
Total (n=151)	30 (19.9)	121 (80.1)	151	

*p value calculated using Fisher's exact test (two-sided).

DISCUSSION

The disease burden of Hepatitis B in developing nations still remains high. Approximately 29.8 million individuals in India are estimated to be living with HBV infection in 2022.⁵ Additionally, the government of India has initiated a program for Hepatitis B vaccination for all healthcare workers who have not been previously immunized against it. This directive was issued in June 2018 under the NVHCP (National Viral Hepatitis Control Program), in collaboration with the universal immunization programme (UIP).⁶ The results from our study showcase that the majority of first-year MBBS students were in agreement regarding the necessity for

Hepatitis B vaccination amongst healthcare workers. The participants had sound awareness regarding modes of transmission and increased occupational risk for healthcare professionals. A similar study revealed an adequate understanding regarding spread of disease and necessity for HBV vaccination while only 16% of the cohort had received their Hepatitis B jabs.⁷ Another study done at a medical college in Rajasthan revealed only 49.6% healthcare workers were vaccinated, among which 62.4% were medical students. Amongst the vaccinated individuals, 30% were found to have low titres (<10 mIU/ml).⁸ Furthermore, a cross sectional study by Bhattarai et al involving medical, dental and nursing students revealed that 42.8% reported at least one needle-

stick and sharps related injury.² While our study population has not yet had such occupational exposures, this reflects the need for complete vaccination and comprehensive knowledge regarding HBV before the students begin their clinical rotations.

On the other hand, our findings showcase that a small but notable proportion of medical students seem to be misinformed about HBV transmission and immunisation. Therefore, it is essential to address misconceptions and common myths regarding HBV so that future physicians are at minimal risk of acquiring the infection. As a whole, the results indicate that regular awareness sessions and vaccination drives by the academic institution could potentially improve the vaccination rates among medical students.

It is noteworthy that similar trends of low complete vaccination rates, despite adequate knowledge of hepatitis B transmission, chronicity and increased occupational risk, are observed both nationally and globally.⁸⁻¹¹ On further inspection, the reasons for lack of compliance seem to be a combination of both, personal (lack of motivation, vaccine hesitancy, fear of side effects, low perceived risks) and infrastructural (limited awareness, vaccine unavailability and the absence of structured immunisation programmes) as the top reasons.⁹⁻¹² While unpublished, data from a medical college in India displayed high compliance rates (89.6%) for immunisation amongst second year MBBS students who were offered a free institutional immunisation drive in contrast to first year students wherein only 16% were fully vaccinated.⁷

A considerable gap is evidently persistent between HBV awareness and actual Hepatitis B vaccination rates among first-year MBBS students. Introducing institutional vaccination awareness sessions before students enter their clinical ward postings, raising awareness regarding documentation and providing catch-up vaccinations could address these gaps.

CONCLUSION

This study found that although the majority of students were having adequate knowledge regarding the necessity of HBV vaccination while being in agreement with the fact that healthcare workers are at an increased risk of acquiring infection, a significant proportion were either partially vaccinated or unvaccinated. A few notable gaps pertaining to knowledge about modes of transmissions were also found implying the need for thorough and well-informed sensitisation sessions for the students. The reasons for non-compliance highlight the need for engaging awareness missions, easy access to institutional vaccination programs and importance of vaccination history documentation.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Shah RS, Acharya AA. Awareness–vaccination gap in Hepatitis B among first-year MBBS students: a cross-sectional study. *Int J Community Med Public Health* 2026;13:6705-9.