# Assessment of Practices Regarding Hepatitis B Infection and Its Prevention among Undergraduate Students of a Government Medical College in Agra, Uttar Pradesh, India

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**Abstract:**

**Introduction:** Hepatitis B virus (HBV) poses a significant occupational risk to healthcare workers, including medical students. Assessing their preventive practices is critical to mitigate future transmission risks within healthcare settings. **Objectives:** This study aimed to assess practices related to Hepatitis B infection and its prevention, and to identify associated factors among medical undergraduates. **Methods:** A cross-sectional study was conducted from April to November 2019, among 573 MBBS students at a government medical college in Western Uttar Pradesh. Data were collected via a semi-structured, pretested questionnaire, capturing socio-demographic details and responses on HBV practices. Practice scores were categorized as good, average, or poor. Statistical analysis was performed using SPSS 29 (trial version), applying Chi-square and Fisher's exact tests to assess associations. **Results:** Out of 600 eligible undergraduate students, 573 responded (96% response rate). Most students (97.2%) exhibited good preventive practices. However, only 74.5% were vaccinated, and a mere 18.8% had ever been tested for HBV. Razor-sharing was reported by 24.3%, highlighting risky behaviour. Lower professional years exhibited higher percentage of good practices. Professional year showed a statistically significant association with practice levels (p=0.01). **Conclusion:** A high proportion of students (97.2%) reported having good practices, however gaps persist in vaccination coverage, testing, and health education participation. Strengthening behavioural interventions, integrating routine HBV screening, and emphasizing preventive training throughout medical education are essential to ensure sustained safe practices.

**Keywords:** Hepatitis B, Medical Students, Preventive Practices, Public Health, Vaccination

## Introduction:

Hepatitis B virus (HBV) infection remains a pressing public health concern globally, recognized not only for its widespread prevalence but also for its long-term clinical consequences. In 2022 alone, hepatitis B was responsible for an estimated 1.1 million deaths, largely attributable to liver cirrhosis and hepatocellular carcinoma (HCC). The World Health Organization (WHO) estimates that approximately 254 million individuals are living with chronic hepatitis B (CHB), with the majority residing in low- and middle-income countries, particularly in the African and Western Pacific regions.[1]

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India, which falls under the intermediate endemicity zone for HBV, accounts for one of the largest reservoirs of chronic HBV infection, with a hepatitis B surface antigen (HBsAg) prevalence of 2%–8% and an estimated 40–50 million chronic carriers.[2-5] Medical students and other healthcare trainees are at increased risk of HBV exposure due to early and frequent contact with blood and bodily fluids, often occurring during their formative years in clinical training. The risk is compounded by limited clinical experience, inconsistent adherence to infection control measures, and underutilization of protective strategies such as vaccination.[6,7] Needlestick injuries, unsafe handling of sharp instruments, and improper disposal of biomedical waste further elevate this risk.[5]

While the introduction of the hepatitis B vaccine and public health initiatives such as the Universal Immunization Programme (UIP) and the National Viral Hepatitis Control Programme (NVHCP) have improved vaccine access, there remains a significant gap in coverage and compliance among healthcare trainees. Research from various medical institutions in India has highlighted that although awareness about HBV is relatively widespread, complete vaccination and safe preventive practices are not universally followed.[4,5,8] For instance, studies have shown that a large proportion of medical students either remain unvaccinated or fail to complete the full three-dose vaccination schedule, and only a small fraction undergo post-vaccination serological testing.[7,8]

Given their critical role in future healthcare delivery, it is imperative that medical students not only possess adequate knowledge of HBV transmission and prevention, but also consistently adhere to protective practices. Evaluating their current practices can help identify gaps and inform interventions aimed at strengthening HBV prevention strategies in academic settings.

This research was carried out to study the practices regarding Hepatitis B infection and its prevention and identifying the factors associated with practices among medical undergraduate students at a government medical college, Agra Uttar Pradesh.

**Methods:**

This cross-sectional study was conducted on MBBS undergraduate students studying in a Medical College in Agra, Uttar Pradesh, India

The study was conducted between April to November 2019. All 600 undergraduate medical students, spanning from first to final professional year (150 students per batch), were invited to participate. Students who could not be contacted despite two follow-up attempts were excluded from the study. Data collection was carried out using a validated, pretested, semi-structured questionnaire, which gathered socio-demographic details and factors related to preventive practices. Validation of questionnaire was done by peer experts with overall Content Validity Index (CVI) value of 0.88. The participation was voluntary, informed written consent was taken prior to data collection.

The socioeconomic status of participants was assessed using the Modified BG Prasad scale 2019.[9] For analysis, the five original classes were grouped into three broader categories: 'Upper' (combining Class I and II), 'Middle' (including Class III and IV), and 'Lower' (Class V).

Preventive practices were assessed through five questions; these questions were selected on the basis of CVI score of 1 for each. Assessment was based on Likert scale of 1–3; poor, average and good respectively, with maximum score of 15 and minimum of 3. The participants were classified into three categories based on their scores as good practices meaning score more than 11; average practices meant score ranging from 6 – 10; and poor practices having score less than equal to 5.

The data was collected through self-administered questionnaire though Google forms and was entered to MS excel, the data was analyzed after data cleaning, the normality was checked, and other statistical tests such as chi square and Fischer exact test were applied to find out the factors associated with practices using SPSS 29 trial version. The ethical clearance was taken from institutional ethics committee vide letter no. IEC/2018/02.

**Results**

Out of total 600 participants that were enrolled in the study, 573 responded with the response rate of 96%. Among these 573 participants' more than half were of the age more than 22 years (297, 51.8%), with mean age of 22 ± 0.92 years and with dominant female participation (304, 53%). Nearly all of the students were of Hindu religion (529, 92.3%). There was almost equal distribution of participants from each professional year, majority (401, 70%) of the participants were permanent residents of urban areas.

Mean practices score based on questions was 14.02 ± 1.36, almost all of the participants (557, 97.2%) performed good preventive practices.

Table 1 reports the investigation into specific Hepatitis B preventive practices. Almost all participants (556, 97.0%) reported always requesting a new syringe before injections. Majority of the participants (489, 85.3%) had adequate hygiene awareness as they always asked barbers to use new blades for shaving or haircutting. However, some of them (79, 13.8%) admitted sharing of razors with others, highlighting risky practice, most of the participants (509, 88.8%) wore gloves and (467, 81.5%) wore protective clothing and apron while performing laboratory and clinical procedures.

Table 2 provides details about Hepatitis B exposures, vaccination and preventive behaviours. Majority participants (525, 91.6%) reported no history of needle stick or any other exposure injuries, suggesting safe clinical practices. With regard to screening only 108 (18.8%) participants confirmed being tested for Hepatitis B, pointing a substantial gap in surveillance. Out of the total participants, three quarter (427, 74.5%) had received Hepatitis B vaccine, still a quarter (150, 25.5%) needed vaccination. Most of the participants (504, 88%) encouraged family and friends to get vaccinated against Hepatitis B. Only 229 (40%) of the participants had participated in health education program on Hepatitis B, highlighting gap of poor involvement in the community education.

**Table 1. Frequency of preventive practices related to Hepatitis B among participants. (N = 573)**

| Preventive Practices | Always, n (%) | Sometimes, n (%) | Never, n (%) |
|---|---|---|---|
| Asking for a new syringe every time an injection is received | 556 (97.0) | 8 (1.4) | 9 (1.6) |
| Asking barber to change blade or scissors before shaving or haircutting | 489 (85.3) | 34 (5.9) | 50 (8.7) |
| Sharing razor/ blade among friends or family members | 79 (13.8) | 60 (10.5) | 434 (75.7) |
| Wearing gloves when administering injections, taking blood samples, or dissection | 509 (88.8) | 46 (8.0) | 18 (3.1) |
| Using protective clothing/ gown/ apron while performing clinical and laboratory procedures | 467 (81.5) | 36 (6.3) | 7 (1.2) |

**Table 2: Hepatitis B–Related Preventive Behaviours and Exposures among participants (N=573)**

| Practice Items | Yes, n (%) | No, n (%) |
|---|---|---|
| Exposure to blood spillage or body Fluid of Hepatitis B infected patient | 34 (5.9) | 539 (94.1) |
| History of needle stick injury or instrumental injury | 48 (8.4) | 525 (91.6) |
| Ever been tested for Hepatitis B | 108 (18.8) | 465 (81.2) |
| Received Hepatitis B Vaccination | 427 (74.5) | 146 (25.5) |
| Advised family members/friends to vaccinate against Hepatitis B | 504 (88.0) | 69 (12.0) |
| Ever participated in health education program related to Hepatitis B | 229 (40.0) | 344 (60.0) |

Note: Responses reflect self-reported experiences and actions related to hepatitis B prevention and exposure.

**Table 3: Association between socio-demographic factors and Hepatitis B preventive practices among participants.**

| Variables | Good Practices n= 557 (97.2%) | Average Practices n= 16 (2.8%) | Total n= 573 (100%) | Chi Square | p-value |
|---|---|---|---|---|---|
| **Age (in years)** | | | | | |
| 17-21 | 267 (46.6) | 09 (1.6) | 276 (48.2) | 0.162 | 0.687 |
| >21 | 290 (50.6) | 07 (1.2) | 297 (51.8) | | |
| **Gender** | | | | | |
| Male | 263 (45.9) | 06 (1.0) | 269 (46.9) | 0.59 | 0.443 |
| Female | 294 (51.3) | 10 (1.8) | 304 (53.1) | | |
| **Socio Economic Class** | | | | | |
| Upper | 479 (83.5) | 12 (2.1) | 491 (85.6) | 1.619# | 0.445 |
| Middle | 48 (8.4) | 03 (0.5) | 51 (8.9) | | |
| Lower | 30 (5.3) | 01 (0.2) | 31 (5.5) | | |
| **Religion** | | | | | |
| Hindu | 513 (89.5) | 16 (2.8) | 529 (92.3) | 0.625# | 0.274 |
| Others | 44 (7.7) | 00 (0.0) | 44 (7.7) | | |
| **Professional Year** | | | | | |
| 1st | 144 (25.1) | 01 (0.2) | 145 (25.3) | 11.17# | 0.01 |
| 2nd | 145 (25.3) | 01 (0.2) | 146 (25.5) | | |
| 3rd | 138 (24.1) | 06 (1.0) | 144 (25.1) | | |
| Final | 130 (22.7) | 08 (1.4) | 138 (24.1) | | |
| **Permanent Residence** | | | | | |
| Urban | 389 (67.9) | 12 (2.1) | 401 (70.0) | 0.787# | 0.448 |
| Rural | 168 (29.3) | 04 (0.7) | 172 (30.0) | | |

Note: #Fisher Exact Test

Table 3 shows the practices among various categories of different variables, as the age increasing the number of participants exercising average practices decreases, females had higher number of participants having good practices regarding Hepatitis B infection, among the socio economic class, higher the class higher the proportion of participants having good practices, very few participants belonged to religion other than Hindu and all of them had good preventive practices. Study reported that as the level of professional year increases, the number of participants having average practices increases. There was almost equal proportion of participants having good and average practices in urban and rural areas.

Only professional year was significantly associated with preventive practices (p value 0.01), rest other factors, age, sex, religion, socio-economic class and permanent residence area were non-significant.

**Discussion**

Hepatitis B is a known risk for the healthcare workers, including medical students undergoing training being exposed to blood and body fluids during this period.[10] This cross-sectional study was conducted in a Medical College in western Uttar Pradesh with participants being undergraduate medical students of all the batches that were studying at the time of study. Study received a high response rate of 96%, with female participants comprising 53% of the sample.

The mean age of participants in present study was 22±0.92 years, aligning well with findings from study done by Chhabra D et al.[4] reporting mean age of 21±5.7 years. Rathi A et al.[5] noted an age range of 17–25 years, with a peak concentration in the 19–20 year group. Although Baig VN et al.[8] reported a higher mean age of 26.08±8.69 years, this was likely influenced by their inclusion of both students and practicing clinicians.

It was found that 97.2% of students consistently requested new syringes for receiving injections, showing strong safe injection awareness. This finding is similar to findings of Sharma S et al.[11] (96%) and Baig VN et al.[8] (95.5%) conducted in other colleges of India. However, targeted awareness program is needed for those still not following this practice.

The vaccination coverage of 74.5% in this study is comparable to Chhabra D et al.[4] and Garg M et al.[12] (76.3% each) and Setia S et al.[11] (73%) but and higher than Rathi A et al.[5] (26.7%), this suggests a potentially more effective framework for vaccine awareness and advocacy. Still measures are required for vaccinating the unvaccinated.

One of the areas of concern highlighted in this study is low rate of Hepatitis B testing and screening rate, merely being 18.8%, which is lower as compared to the studies conducted elsewhere like Vasantha Mallika MC et al.[6] (79.5%) and Al Wutayd O et al.[13] (31.5%). Reluctance or lack of awareness and access to testing could be potential reasons for this finding. While the current medical curriculum prioritizes vaccination, these findings suggest equal importance should be given to routine serological screening.

Around a quarter proportion (24.3%) of the participants reported sharing razors or blades with others is another concerning finding of the study. A targeted health education intervention is required for behaviour change regarding the high risks these practices pose.

A statistically significant association (p value= 0.01) was identified between professional year of participants and overall preventive practices. This study found that higher proportion of participants of lower professional year having good practices as compared with senior participants, contrasting to these Sachidananda MH et al.[14] reported an increase in vaccination rates with increasing professional year which suggests improvement of one dimension of practices.

Overall, while students reported good and positive practices, there are some clear gaps, in vaccination, screening and some risky behaviours that should be addressed.

**Conclusion:**

In this study, important trends were observed in Hepatitis B preventive practices among medical undergraduates in Western Uttar Pradesh. Nearly all participants (97.2%) adhered to recommended preventive measures, particularly in safe injection practices. However, vaccination coverage remains suboptimal, with just 74.5% reporting being vaccinated, and a very low 18.8% having been ever screened for Hepatitis B infection. Notably, nearly a quarter of the students admitted to sharing razors, highlighting important behavioural risks. It was found that students in earlier professional years exhibited better preventive practices compared to their senior counterparts, indicating an opportunity for targeted educational interventions as students progress through their training. These findings highlight the pressing need for enhanced screening programs, reinforced health education, and focused behavioural change strategies to safeguard the future healthcare workforce from Hepatitis B infection.

**Recommendations:**

To strengthen preventive measures against Hepatitis B among medical students, it's recommended to implement mandatory Hepatitis B screening when students join and again before finishing their training course. Concurrently, there's a need for focusing on the habits of the participants not just increasing the knowledge component, specifically addressing high-risk behaviors such as the sharing of razors and other personal sharps. To reinforce these routine friendly talk and feedback from peers focusing on behavioural change can be done. Finally, a deeper investigation is required for assessing why "average practices" concerning

preventive behaviors tend to increase with seniority, ensuring consistent optimal behaviours throughout their medical training.

**Limitations:**

Being cross-sectional, this study offers only a snapshot of practices, preventing causal inferences or tracking changes over time. Self-reported data introduces potential social desirability bias, possibly inflating positive outcomes. This uni-centric study focus in Agra restricts generalizability to other medical colleges.

**Declaration**

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Conflict of Interest: Nil

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