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Understanding Hepatitis B–Related Knowledge, Attitudes, and Practices Among Nurses of a Selected Tertiary Hospital in Northwestern Bangladesh

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ABSTRACT

Background and Aims: Hepatitis B virus (HBV) infection remains a global health concern, with nurses being particularly vulnerable to occupational exposure. In Bangladesh, however, there is limited understanding of the knowledge, attitudes, and practices (KAP) of nurses concerning HBV, highlighting a significant gap in research and awareness. Therefore, the study aimed to assess the KAP of nurses regarding HBV.

Methods: This cross-sectional study was conducted among 120 nurses through face-to-face interviews using a semi-structured questionnaire, employing a convenience sample technique. Different statistical tools, including frequency distribution, Box and Whisker plot, the non-parametric Mann–Whitney U test and Kruskal–Wallis test were used in data analysis.

Results: The average age of the participants was 34.5 years, and most of the participants were female (83%). Nurses' vaccination uptake was 70.8% This study revealed that nurses' knowledge scores have a median of 0.77 (Interquartile range (IQR): 0.13). The Attitude scores, with a median of 0.88 (IQR: 0.25), and the practice scores was 0.87 (IQR: 0.38) regarding HBV. The nonparametric test demonstrated significant ($p = 0.046$) variation of knowledge among nurses across their age groups and young-aged nurses showed better knowledge score. On the other hand, nurses' attitudes and practice behaviors significantly differed by their sex. Female nurses demonstrated higher attitude scores than male nurses [median attitude score: 0.88 (95% CI: 0.81–0.99) vs. 0.75 (95% CI: 0.74–0.88); $p = 0.005$]. Similarly, female nurses showed higher practice scores [median practice score: 0.87 (95% CI: 0.69–0.98) vs. 0.75 (95% CI: 0.62–0.87); $p = 0.034$].

Conclusions: Nurses' KAP were found to be unsatisfactory. Knowledge was differed significantly across age groups. Furthermore, significant sex-based differences were observed in attitudes and practices, with female nurses demonstrating more favorable attitudes and better practices than male counterparts.

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Key Points

- Nurses are vulnerable to occupational exposure to the Hepatitis B virus (HBV) infection
- The vaccination uptake among nurses was 70.8%
- Nurses' HBV-related knowledge, attitude and practice behavior was improved
- Knowledge score was significantly varied across their age groups and younger nurses showed better knowledge
- Female nurses had significantly higher attitude and practice behaviors compared to male counterparts

1 | Introduction

Infectious diseases caused by the hepatitis B virus (HBV) pose a major global public health threat. Recent estimates suggest that around one-third of the total population of the world has been infected with HBV [1]. It is often described as a "silent killer" due to its asymptomatic progression and severe long-term consequences [2]. According to the World Health Organization (WHO), approximately 240 million people worldwide live with chronic HBV infection, making up roughly one-third of all people who have ever been infected with the virus [2].

Healthcare workers (HCWs), particularly nurses, are very susceptible to contracting HBV in healthcare environments. The incidence rate of HBV among HCWs is about 2 to 10 times greater than that of the general population worldwide [3, 4]. Lack of educational intervention regarding infection control, contact with non-intact skin, insufficiently sterilized medical equipment, and percutaneous or mucous exposure to infectious blood or bodily fluids were indicators of risk for HBV infection in the setting of healthcare workers [5, 6]. The typical risk of developing HBV infection from intravascular insertion to contaminated blood is analyzed to be between 6% and 30%, whereas the risk for the virus that causes human immunodeficiency virus is around 0.3% [7].

Bangladesh is going through an epidemiological transition with significant reductions in fatality due to acute, infectious, and parasitic diseases and increases in non-communicable, degenerative, and chronic diseases over the last 20 years [8–15]. Along with this, the HBV infection is a significant health concern with an estimated prevalence of around 4%–5% [16]. Despite the introduction of a national vaccination program, chronic HBV infection remains prevalent, particularly among high-risk groups such as intravenous drug users, healthcare workers, and individuals with a history of blood transfusions [17]. Studies have shown that a large number of HBV cases in the country go undiagnosed, contributing to delayed treatment and increased liver-related health issues. Socio-economic factors, including stigma, lack of awareness, and limited access to healthcare, particularly in rural areas, further complicate the management of HBV [18, 19].

In Bangladesh, recent evidence indicates that nurses generally possess a high level of awareness regarding hepatitis B [20–23]. However, a substantial gap persists between knowledge and the adoption of effective preventive practices. For instance, two studies reported that although most nurses demonstrated adequate knowledge of HBV/HCV prevention, only about 70.6% translated this knowledge into appropriate preventive behaviors [22, 24]. Similarly, research among senior staff nurses found high levels of knowledge about HBV transmission, infection control, and prevention (85%–89%), though important misconceptions persisted, and some remained only partially vaccinated [23]. Collectively, these findings suggest that knowledge alone is insufficient to ensure comprehensive HBV protection within the Bangladeshi healthcare system.

While existing research in Bangladesh has explored various aspects of HBV, including its prevalence, treatment barriers, and socio-economic challenges, there remains a significant gap in understanding healthcare workers' knowledge, attitudes, and practices (KAP) regarding HBV, particularly among nurses [20–22]. As frontline providers, nurses play a critical role in HBV prevention, clinical management, and patient education; however, few studies have specifically evaluated their KAP in the Bangladeshi context. Existing research among the general population, medical students, and barbers consistently demonstrates inadequate KAP toward HBV [25–27]. This gap in the literature limits the development of targeted, evidence-based interventions aimed at improving HBV-related healthcare practices and patient outcomes. The present study seeks to address this gap by assessing nurses' KAP regarding HBV infection, including their understanding of prevention strategies, treatment protocols, and the psychosocial dimensions of caring for individuals affected by HBV.

2 | Methods

The STROBE checklist was followed to prepare the manuscript (Supporting Information Table S1).

2.1 | Ethical Consent and Permission for Data Collection

The permission of this study was approved by the Institutional Animal, Medical Ethics, Biosafety, and Biosecurity Committee (IAMEBBC) of the Institute of Biological Sciences, University of Rajshahi (Ref. Memo No. 12[22]/320/IAMEBBC/IBSc). Both written and verbal consent were taken from each participant before initiating the interview for data collection. A brief introduction on the aims and objectives of the study was given first, and then, the written consent was translated into Bengali. Participants who agreed to the consent were finally included in the study.

2.2 | Study Area

The study was conducted at Rajshahi Medical College Hospital (RMCH), a major healthcare facility (tertiary hospital) in northwestern Bangladesh. RMCH was selected due to its large nursing workforce of around 1300, which spans various specialties and provides care to a high volume of patients,

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including those at risk of HBV exposure [28]. This setting offered a relevant context for evaluating nurses' knowledge, attitudes, and practices (KAP) concerning HBV, reflecting both the challenges and training needs present in a busy, high-risk healthcare environment.

2.3 | Study Setting, Sample Size, and Participants

Participants for this study were recruited using a convenience sampling method from among the nurses employed at RMCH. Recruitment involved in-person invitations, where eligible nurses were informed about the study objectives, procedures, and their rights, and were invited to participate voluntarily. Information sessions were held to ensure clarity and obtain informed consent. This study was a cross-sectional study conducted covering all departments of RMCH from January to December 2023.

A convenient sampling technique was followed for this study. The sample size of the study was calculated by using the following formula:

$$n = \frac{z^2 pq}{d^2}, \quad (1)$$

where,

n = assumed/desired sample size;

z = the standard normal deviation 1.96;

p = percentage of knowledge is 91.5% = 0.915;

q = 1–p;

d = Degree of error (5%) = 0.05.

During the literature search, the proportion of knowledge of good knowledge was high (91.5%) was $p = 0.\ 915$ [29].

Using equation (1), the sample size for the study when $p = 0.915$ is

$$n = \frac{(1.96)^2 \times 0.915 \times (1 - 0.915)}{(0.05)^2} \approx 120.$$

Therefore, the final sample size was 120.

2.4 | Inclusion and Exclusion Criteria

The inclusion criteria of this study were: i) nurses of Rajshahi Medical College hospital; ii) nurses aged more than 18 years old; iii) nurses who were Bangladeshi by birth; iv) nurses who gave consent to participate. The exclusion criteria for the study were: i) nurses from the other hospitals visiting RMCH during the study period; ii) nurses holding dual citizenship; and iii) nurses who worked at RMCH but were admitted to the hospital due to illness.

2.5 | Outcome Measures

2.5.1 | *Sociodemographic Measures*

Age (Below 30 years, 31–40 years, Above 41 years), Monthly family income in Taka (Below 30000 Taka, 30001 to 40000 Taka, Above 40001 Taka), Highest academic degree (Diploma in Nursing, BSc in Nursing, Master of Science in Nursing/MPH), Area of residence (Urban, Rural), Religion (Muslim, Non-Muslim), Job title/designation of the respondents (Staff Nurse, Senior Staff Nurse, Nursing In-charge), Marital status (Ever Married, Never Married), Work station (Medicine, Surgery, ICU, CCU and others) were taken as socio-demographic variables of this study.

2.5.2 | *Knowledge, Attitude, and Practice Measurement*

Globally, multiple studies were found that examined the knowledge, attitude, and practices of nurses regarding the hepatitis B virus [23, 25, 26]. To assess the KAP of nurses, the current study used a semi-structured questionnaire containing 22 questions for knowledge, 08 questions for attitude, and 08 questions for the practice behaviors. The questionnaire has been prepared based on the existing literature review.

2.5.3 | *Reliability and Validity of the Study*

To ensure the reliability and validity of the study, we employed several techniques: (i) pre-tested the questionnaire; (ii) SPSS 26.0 was used for data analysis; (iii) descriptive statistics were performed to observe absurd results; (iv) reliability analyzes were conducted, with Cronbach's alpha (a reliability coefficient) found to be 0.87 for the variables used in KAP; and (v) different statistical techniques were applied.

2.5.4 | *Data Management and Analysis*

The study employed several statistical tools and techniques to analyze the data. Initially, descriptive statistics were performed, including the different tables and graphs. Respondents' knowledge, attitude and practice score was calculated using average (e.g., knowledge score = sum of knowledge items/total number of items) technique. The Box and Whisker plot was performed to summarize the distribution of all scores. The normality assumption was then assessed to determine the distribution of the knowledge, attitude, and practice scores before conducting inferential analyzes (Supporting Information Table S2). As all scores were found to deviate from normality, non-parametric tests were applied. Before conducting inferential tests, the distribution of participants across all categorical variables was examined. Subgroups with extremely small sample sizes were not subjected to inferential statistical testing because estimates and measures of association may be unstable and potentially misleading. Such categories of variables (e.g., religion and residence) were reported descriptively using frequencies and percentages. The findings from these subgroup analyzes were therefore not considered definitive evidence of association.

The inferential analysis- Mann–Whitney U test and Kruskal–Wallis test was subsequently performed to examine variations in knowledge, attitude, and practice scores across different

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socio-demographic groups. A p-value of 5% was deemed significant at the 95% confidence interval. The SPSS (Version 26) and Microsoft Office 2019 software were used for all the analysis.

3 | Results

3.1 | Socio-Demographic Characteristics of the Respondents

Out of 120 nurses, the majority, 60 (50.0%), were aged 31 to 40 years old, female (99, 83%), and had completed the diploma (45, 37.5%) as their highest degree. Muslim participants accounted for 117 (97.5%) of the sample, while 106 (88.3%) resided in urban areas (Table 1).

3.2 | Nurses' Knowledge Regarding the Hepatitis B Virus

Among the 120 respondents, most of the respondents, 117 (97.5%), knew hepatitis, 116 (96.7%) had heard of a disease termed HBV, 119 (99.2%) knew hepatitis is a viral disease, 114 (95.0%) agreed that HBV affects liver disease, 113 (94.2%) agreed that HBV causes liver cancer, and 84 (70.0%) disagreed that HBV-infected persons can donate blood (Table 2).

3.3 | Nurses' Attitudes Regarding the Hepatitis B Virus

Almost three-fourth of the respondents (72.5%) had a positive attitude about HBV as a public problem in Bangladesh, 96.7% had a good attitude about it is important for healthcare professionals, including nurses, to be educated about HBV, 85.0% had a positive attitude about HBV is a serious health issue in our community, and 92.5% had attitude of necessary standard protocols for biomedical waste management (Supporting Information Table S3).

3.4 | Nurses' Practice Regarding the Hepatitis B Virus

Among 120 nurses, 71.67% had participated in the HBV vaccination program as a provider, 91.7% were aware of the available treatments for HBV, 60.0% had insufficient practices about receiving specific training on HBV prevention and management in the last year, 89.2% good practices in preventing HBV transmission in their workplace, and 96.7% practiced using sterile instruments, gloves, and gowns. As a receiver, the hepatitis B vaccination uptake among nurses was 70.8% (Table 3).

3.5 | Overall Knowledge, Attitude, and Practice Behaviors

The descriptive statistics and box plot analysis of the knowledge, attitude, and practice scores regarding Hepatitis B (HBV) among nurses reveal that the knowledge scores have a mean of 0.7932 and a median of 0.7727 (Interquartile range [IQR]: 0.13). The Attitude scores, with a mean of 0.8604 and a median of 0.88 (IQR: 0.25). The Practice scores, with a mean of 0.79 and a median of 0.87 (IQR: 0.38) (Figure 1). Overall, the KAP score was within the upper quartile.

TABLE 1 | Socio-demographic characteristics of respondents.

Characteristics	Frequency	Percentage
Age		
Below 30 years	39	32.5
31–40 years	60	50.0
Above 41 years	21	17.5
Sex of the respondents		
Male	21	18
Female	99	83
Monthly family income in Taka		
Below 30,000 Taka	44	36.7
30,001 to 40,000 Taka	57	47.5
Above 40,001 Taka	19	15.8
Highest academic degree		
Diploma in Nursing	45	37.5
BSc in Nursing	32	26.7
MS/MPH	38	35.4
Area of residence		
Urban	106	88.3
Rural	14	11.7
Religion of the respondents		
Muslim	117	97.5
Non-Muslim	3	2.5
Designation		
Staff Nurse/In-charge	12	10.0
Senior Staff Nurse	108	90.0
Marital status		
Ever married	107	89.2
Never married	13	10.8
Work station		
Medicine	32	26.7
Surgery	29	24.2
ICU/CCU	22	18.3
Others	37	30.8

3.6 | Variation in Knowledge, Attitude, and Practices of the Respondents

Non-parametric Mann–Whitney U test and Kruskal–Wallis test was performed to show how nurses' KAP significantly varied across their socio-demographic characteristics. The analysis showed significant differences in nurses' knowledge [median score: 0.82 (IQR: 0.77–0.86) versus 0.77 (95% CI: 0.73–0.82); $p = 0.046$] across their age groups, and nurses aged below 30 showed comparatively higher knowledge than the others. Nurses' attitudes and practices varied significantly according to

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TABLE 2 | Knowledge regarding the Hepatitis B Virus among respondents.

Knowledge-related characteristics	No f (%)	Yes f (%)
Have heard of Hepatitis	3 (2.5)	117 (97.5)
Have heard of Hepatitis B	4 (3.3)	116 (96.7)
Is Hepatitis B a viral disease?	1 (0.8)	119 (99.2)
Does Hepatitis B affect liver function?	6 (5.0)	114 (95.0)
Does Hepatitis B cause liver cancer?	7 (5.8)	113 (94.2)
Does Hepatitis B affect any age group?	18 (15.0)	102 (85.0)
Are the early symptoms of hepatitis B are same as cold and flu?	39 (32.5)	81 (67.5)
Is Jaundice one of the common symptoms of hepatitis B?	6 (5.0)	114 (95.0)
Are nausea, vomiting, and loss of appetite common symptoms of hepatitis B?	19 (15.8)	101 (84.2)
Is hepatitis B transmitted by unsterilized syringes, needles, and surgical instruments?	5 (4.2)	115 (95.8)
Is hepatitis B transmitted by contaminated blood and blood products?	2 (1.7)	118 (98.3)
Is hepatitis B transmitted by using the blades of the barber's/ear and nose piercing?	17 (14.2)	103 (85.8)
Is hepatitis B transmitted by unsafe sex?	7 (5.8)	113 (94.2)
Is hepatitis B transmitted from mother to child?	5 (4.2)	115 (95.8)
Is hepatitis B transmitted by contaminated water/food prepared by a person suffering from these infections?	69 (57.5)	51 (42.5)
Is hepatitis B treatable?	19 (15.8)	101 (84.2)
Is the hepatitis B virus self-cured by the body?	73 (60.8)	47 (39.2)
Is vaccination available for hepatitis B?	10 (8.3)	110 (91.7)
If yes, then do you know about the vaccination schedule for both infants and adults?	16 (13.3)	16 (86.7)
Does a person donate blood if he/she have hepatitis B?	84 (70.0)	36 (30.0)
Do you know how hepatitis B is diagnosed?	11 (9.2)	109 (90.8)
Does the Hepatitis B vaccine prevent the disease?	6 (5.0)	114 (95.0)

TABLE 3 | Distribution of practice regarding Hepatitis B Virus among nurses.

Practice-related characteristics	No f (%)	Yes f (%)
As a provider, have you ever participated in any Hepatitis B vaccination program?	34 (28.3)	86 (71.67)
Are you aware of the available treatments for Hepatitis B?	10 (8.3)	110 (91.7)
Have you received specific training on Hepatitis B prevention and management in the last year?	72 (60.0)	48 (40.0)
Do you practice safe behaviors to prevent Hepatitis B transmission in your workplace?	13 (10.8)	107 (89.2)
Do you educate your patients about the spread and severity of Hepatitis B?	10 (8.3)	110 (91.7)
Have you received complete dose (three dose) of hepatitis B vaccine?	35 (29.2)	85 (70.8)
Did you usually test blood for hepatitis B?	22 (18.3)	98 (81.7)
Do you use sterile instruments, gloves, or gowns when managing hepatitis B patients?	4 (3.3)	116 (96.7)

their sex. Female nurses demonstrated higher attitude [median score: 0.88 (IQR: 0.81–0.99) vs. 0.75 (95% CI: 0.74–0.88); $p = 0.005$) and practice [median: 0.88 (IQR: 0.69–0.98) vs. 0.75 (95% CI: 0.62–0.88); $p = 0.034$) compared with their male counterparts (Table 4).

4 | Discussion

Healthcare workers are at serious risk for occupational health hazards due to blood-borne pathogen exposure, especially HBV diseases. Due to their early exposure to hospital environments, healthcare workers, particularly nurses, are always at risk of contracting HBV from infected individuals [30]. To mitigate the risk of infection, it is crucial to possess accurate information, maintain a positive attitude toward prevention, and consistently adhere to hygienic practices. The aim of this study was to assess the KAP regarding HBV among nurses of a selected tertiary hospital in northeastern Bangladesh.

The study demonstrated upper quartile of knowledge, attitude, and practice behaviors regarding HBV. The findings indicate

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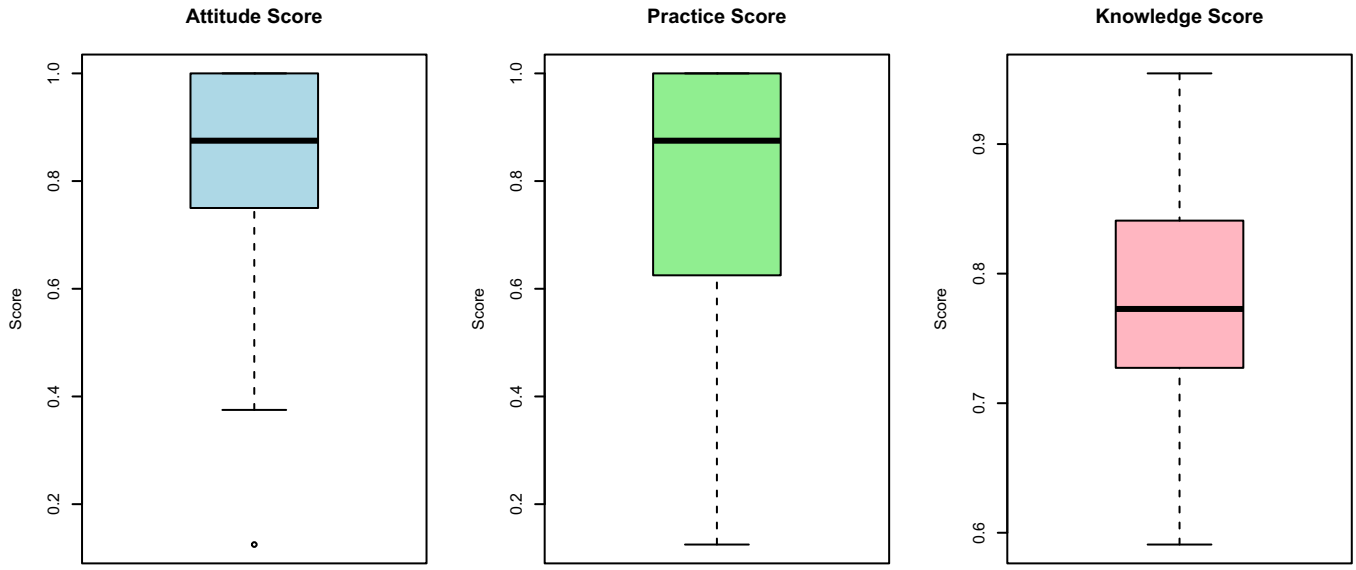


FIGURE 1 | Knowledge, attitude, and practice behaviors of the respondents.

TABLE 4 | Non-parametric Mann–Whitney U test and Kruskal–Wallis test to show the knowledge, attitude, and practice variations among different socio-demographics.

Characteristics	*n*	Median knowledge score (IQR)	*p** value	Median attitude score (IQR)	*p*# value	Median practice score (IQR)	*p*μ value
Age							
Below 30 years	39	0.82 (0.77–0.86)	0.046	0.88 (0.88–1.00)	0.468	0.88 (0.62–0.94)	0.946
31–40 years	60	0.77 (0.73–0.82)		0.88 (0.75–1.00)		0.88 (0.62–0.88)	
Above 41 years	21	0.77 (0.73–0.82)		0.88 (0.75–1.00)		0.88 (0.62–1.00)	
Highest academic degree							
Diploma in Nursing	45	0.77 (0.73–0.86)	0.632	0.88 (0.88–1.00)	0.932	0.88 (0.75–1.00)	0.729
BSc in Nursing	32	0.82 (0.76–0.86)		1.00 (0.75–1.00)		0.88 (0.62–1.00)	
MSN/MPH	43	0.77 (0.73–0.82)		0.88 (0.75–1.00)		0.75 (0.62–0.88)	
Monthly income							
Below 30,000 Tk	44	0.82 (0.73–0.86)	0.309	1.00 (0.88–1.00)	0.315	0.88 (0.62–1.00)	0.745
30,001 to 40,000 Tk	57	0.77 (0.73–0.82)		0.88 (0.75–1.00)		0.88 (0.62–0.88)	
Above 40,001 Tk	19	0.77 (0.73–0.82)		0.86 (0.80–0.98)		0.88 (0.69–1.00)	
Sex of the respondents							
Male	21	0.77 (0.73–0.86)	0.933	0.75 (0.74–0.88)	0.005	0.75 (0.62–0.87)	0.034
Female	99	0.77 (0.73–0.82)		0.88 (0.81–0.99)		0.87 (0.69–0.98)	
Marital status							
Ever married	107	0.77 (0.73–0.84)	0.341	0.88 (0.75–1.00)	0.837	0.88 (0.62–1.00)	0.552
Never married	13	0.77 (0.73–0.82)		0.87 (0.81–1.00)		0.88 (0.75–0.88)	

*Mann–Whitney U/Kruskal–Wallis test for knowledge.
#Mann–Whitney U/Kruskal–Wallis test for attitude.
μMann–Whitney U/Kruskal–Wallis test for practice; MSN- Master of Science in Nursing; MPH- Master in Public Health.

that while knowledge and attitudes toward HBV among nurses are improving, there remains a gap in translating this knowledge and attitude into uniform and optimal practice behaviors. In addition to this, nurses' knowledge were significantly varied based on their age groups. Furthermore, differences emerge in both attitude and practice according to sex. Female nurses tend to exhibit more positive attitudes toward the subject compared to male nurses, and this more favorable attitude is also reflected in their practice behaviors.

In the present study, the majority of nurses' knowledge demonstrated a highest 25% of the observed scores regarding hepatitis B virus. However, existing literature indicates that knowledge among nurses may range between moderately satisfactory to satisfactory [23, 24, 31]. Sannathimmappa et al. (2019) reported that more than half of pre-clinical students lacked knowledge of the clinical manifestations, including the symptoms, signs, and potential complications associated with HBV infection [31].

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Regarding attitude, the present study revealed that a substantial proportion of respondents demonstrated a positive attitude toward hepatitis B virus (HBV). Similarly, a study by Dwiartama et al. (2022) reported that approximately one-third of participants exhibited an unfavorable attitude toward HBV, whereas the majority held favorable views regarding preventive measures [32]. These findings are consistent with those of the current study, underscoring the ongoing need for HBV-related health promotion initiatives, as well as targeted education and training programs for nurses in tertiary care hospitals in northeastern Bangladesh [33].

The majority of participants exhibited improved preventive practices against hepatitis B virus (HBV) infection. The literature indicated that nurses' practice on hepatitis B prevention remain inadequate in several populations, including healthcare workers, across different regions globally [34]. Conversely, studies conducted in Sudan have reported improved levels of compliance, with over eight out of ten healthcare workers demonstrating awareness of HBV prevention protocols and consistently practicing measures such as proper instrument sterilization and the use of gloves [35]. The results of the current study are in agreement with these findings.

Nurses' knowledge was significantly varied across their age group and young age group showed better knowledge. On the other hand, nurses' attitude and practice variation were observed according to their sex, and female nurses were more likely to demonstrate better attitude and practices concerning HBV infection. This difference may be attributed to greater adherence to infection prevention guidelines, higher risk perception, and stronger compliance with standard precautions among female healthcare workers [22]. In addition, female professionals often show more proactive health-seeking behaviors, including participation in training programs, vaccination uptake, and routine use of personal protective equipment. Workplace roles and responsibilities that emphasize patient safety and infection control may also contribute to this trend [22]. The result is similar to a study that female healthcare workers are more likely to demonstrate outstanding practices concerning HBV [22, 36].

The current study highlights the need for continued improvement in the KAP of nurses regarding HBV prevention. Despite favorable attitudes and improved knowledge, gaps in HBV practices and vaccination coverage suggest that broader institutional support and enhanced training programs are necessary, particularly for older-aged nurses. Previous research has emphasized the importance of tailored, region-specific interventions and consistent updates in nursing curricula to address evolving challenges in infection prevention [37, 38]. Further studies are needed to explore the influence of workplace culture and resources on HBV practices among nurses, particularly in older-aged and male nurses. Additionally, integrating more comprehensive, interactive training programs and emphasizing the importance of vaccination could further reduce the transmission risk among healthcare workers [20]. These findings call for ongoing evaluation of healthcare policies and the development of evidence-based strategies to enhance infection control among nursing workforce in northeastern Bangladesh.

5 | Strengths and Limitations

A disadvantage of this research is the small sample size, as well as the fact that the respondents provided their self-reported data. The design of the research, which was cross-sectional, can also be considered one of the limitations. Another limitation of this study is that there is only one tertiary hospital in northeastern Bangladesh, and the study used convenience sampling, which may affect the generalizability of the findings. Since participants were selected based on availability rather than random selection, the sample may not represent the broader population of nurses in Bangladesh, particularly those in rural or underserved areas. In addition, this study dis not perform any multivariable models to determine the causal risk factors. This could introduce bias and limit the ability to apply the findings to all healthcare workers, reducing the overall external validity of the study. Future research using more representative sampling methods would enhance the generalizability of the results. Despite the limitations, this study offers some important insights about KAP among the frontline HCWs, the nurses, about HBV for the policymakers and stakeholders.

6 | Conclusion

The study demonstrates the need for educational interventions to improve nurses' knowledge, attitudes, and practices (KAP) regarding Hepatitis B Virus. While most nurses demonstrated an understanding of HBV transmission prevention, overall KAP was not satisfactory, indicating gaps in critical areas of HBV knowledge. Nurses' knowledge was significantly varied across their age groups and younger aged nurses showed better knowledge. In addition, female nurses showed more attitudes and practice behaviors regarding HBV. Although, this study does not offer novel findings on KAP but contributes to the ongoing conversation about improving HBV-related practices among nurses of tertiary hospitals in northeastern Bangladesh. The study also recommends further study representing all nurses in Bangladesh.

Author Contributions

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The authors have nothing to report.

Ethics Statement

The study followed the declaration of Helsinki, and the permission for this study was approved by the Institutional Animal, Medical Ethics, Biosafety and Biosecurity Committee (IAMEBBC) of the Institute of Biological Sciences, University of Rajshahi (Ref. Memo No. 12[22]/320/IAMEBBC/IBSc). Both written and verbal consent were taken from each participant before initiating the interview for data collection. A brief introduction on the aims and objectives of the study was given first, and then, the written consent was translated into Bengali. Participants who agreed to the consent were finally included in the study.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The datasets generated and/or analyzed during the current study are available from the corresponding author upon request at meshbah037@gmail.com.

Transparency Statement

The corresponding author affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.
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Supporting File 2: hsr273265-sup-0002-Supplementary_table_S2.docx.
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