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Vaccination Status, Knowledge, Attitude and Practice Regarding Hepatitis B among College Students from Rajshahi City, Bangladesh

¹ Dr. Abdullah Al Mukit, ² Dr. Mohd. Harun Or Rashid, ³ Dr. Shoaib Mohammad Riyadh, ⁴ Dr. Md. Rofiqul Islam, ⁵ Dr. Shuvashis Saha Shuvo, ⁶ Dr. Md. Rahul Parvez

¹ Assistant Professor, Department of Hepatology, Rajshahi Medical College & Hospital, Rajshahi, Bangladesh

² Former Professor and Head, Department of Hepatology, Rajshahi Medical College & Hospital, Rajshahi, Bangladesh

³ Assistant Registrar, Department of Hepatology, Rajshahi Medical College & Hospital, Rajshahi, Bangladesh

Associate Professor & Head, Department of Hepatology, Rajshahi Medical College & Hospital, Rajshahi, Bangladesh

⁵ Indoor Medical Officer, Department of Gastroenterology, Rajshahi Medical College & Hospital, Rajshahi, Bangladesh

⁶ Lecturer, Department of Community Medicine, Rajshahi Medical College & Hospital, Rajshahi, Bangladesh

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Corresponding Author: Dr. Abdullah Al Mukit

Abstract

Background: Hepatitis B virus (HBV) is a significant global health concern, particularly in developing countries like Bangladesh. Despite the intermediate endemicity, there is limited knowledge regarding HBV transmission, prevention, and the importance of vaccination. This study aimed to assess the knowledge, attitude, and practices regarding HBV among college students in Rajshahi City, Bangladesh, and examine the correlation between educational level and preventive health behaviors.

Method: A descriptive cross-sectional study was conducted between January and March 2024 among grade 11 and 12 students from five randomly selected colleges in Rajshahi City. Data were collected using a self-administered questionnaire covering sociodemographic characteristics, knowledge of HBV, attitudes, and preventive practices. Data analysis was performed using appropriate non-parametric statistical tests.

Result: Out of 574 students approached, 512 participated, the findings revealed a significant association between

higher educational qualifications and better knowledge scores, which in turn were linked to positive preventive behaviors such as vaccination (87.5%), asking for new syringes (63.9%), and participation in health education programs (14.3%). However, misconceptions persisted, with 30.3% believing it could be transmitted via food or water. Additionally, 68.6% of respondents reported avoiding meeting HBV patients, highlighting the social stigma associated with the disease.

Conclusion: This study highlights the importance of education in improving HBV-related knowledge and preventive practices among college students in Rajshahi City. Despite the association between higher knowledge and better health behaviors, misconceptions and stigma remain common. Integrating comprehensive HBV education into academic curricula and targeted awareness programs may help address these gaps and contribute to national and global HBV elimination efforts.

Keywords: HBV, KAP, Vaccination, Public Health, Bangladesh

Introduction

Hepatitis B virus (HBV) is an important hepatotropic virus that specifically targets the liver, leading to both acute and chronic hepatitis. In severe cases, it can progress to cirrhosis and hepatocellular cancer. In 2022, the World Health Organization (WHO) estimated that there were 254 million people worldwide who had chronic hepatitis B infection. Each year, there is around 1.2 million newly estimated cases of HBV infection, resulting in 1.1 million fatalities, largely caused by cirrhosis and hepatocellular cancer [1]. Given the severity of the situation, efforts are being made to eliminate HBV hepatitis, by the year 2030. This objective is outlined in the Sustainable Development Goal three and the Global Health Sector Strategy on viral hepatitis for the period of 2016-2021 [2, 3]. Despite Bangladesh being in an intermediate endemicity zone with a prevalence of hepatitis B among the general population ranging from 4-5.5%, HBV remains the primary cause of all forms of chronic liver disorders (CLD) and the second most prevalent cause of acute hepatitis in the country [4, 5].

Previous research shows the alarming fact that a substantial proportion of apparently healthy Bangladeshis are unaware of their HBV infection state and serve as a potential source to continue the transmission. To ensure the safeguarding of populations' health, it is imperative to understand their health-seeking behavior as well as their understanding of and attitudes towards HBV infection [6]. Consequently, numerous global studies have been undertaken to evaluate individuals' understanding and convictions on HBV and its transmission [7-10]. There have been few studies on knowledge and practices about viral hepatitis B among the general population in developing countries like Bangladesh [8,11]. However, conducting research like this is essential for the proper allocation of scarce resources in disadvantaged socioeconomic and educational circumstances. This study aimed to examine the correlation between knowledge, attitude, and practices regarding hepatitis B among college students from Rajshahi City.

Materials and Methods

Study design and participant characteristics

This descriptive cross-sectional study was conducted in Rajshahi City between January and March 2024. The study included college students from grades 11 and 12 who were enrolled in non-science disciplines. Rajshahi City is divided into five administrative thanas, comprising a total of 41 colleges. One college from each thana was selected using a lottery method, resulting in five colleges being included. All eligible students present during data collection were invited to participate, while those not attending classes or unreachable were excluded. Data were collected using a self-administered questionnaire after explaining the study objectives. Written informed consent was obtained from all participants. Participation was voluntary, confidentiality was ensured, and no incentives were provided.

Study Instrument

The questionnaire was adapted from previously published studies [8, 11-13] and reviewed by a multidisciplinary team of gastroenterologists, hepatologists, and public health experts to ensure relevance and clarity. It was translated into Bangla and back-translated into English to maintain accuracy. A pilot test was conducted among students not included in the final sample to refine the tool.

The finalized questionnaire consisted of four sections: sociodemographic characteristics, knowledge, attitude, and practices related to hepatitis B. Each knowledge item had three response options: 'yes,' 'no,' and 'do not know.' Correct answers were scored as 1 and incorrect answers as 0, on a scale of 0-28, a score higher than 11 was deemed sufficient knowledge, while a score of 11 or lower was seen as insufficient. The practice section included 7 questions, each categorized as either good or poor practice, assigning a score of 1 to excellent and 0 to harmful practices, with a score ranging from 0 to 8. The scale categorizes practice as good if the score is greater than five and as poor if the score is less than or equal to 5.

Statistical Methods

Data were entered and analyzed using SPSS version 25. Normality was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. As the data were non-normally

distributed, non-parametric tests were applied. Descriptive statistics were used to summarize participant characteristics. Associations between variables were examined using Spearman's correlation, Mann-Whitney U test, Kruskal-Wallis test, and Chi-square test, as appropriate.

Results

General Characteristics

Table 1 presents the overall characteristics of the respondents who participated in the study. A total of 512 out of 574 students took part. The respondents were predominantly late adolescents, with a mean age of approximately 18 years. Male students slightly predominated, though participation was fairly balanced between genders. More than half of the students belonged to smaller families. Students from both academic years were included, with a higher representation from the second year compared to the first year.

Table 1: Socio-demographic characteristics

Variables		Frequency (n)	Percentage (%)
Age (in Years)	16-18	420	82.0
	19-20	92	18.0
	Mean \pm SD	17.75 \pm 1.047	
Gender	Male	278	54.3
	Female	234	45.7
Family Member	\leq 4	288	56.3
	$>$ 4	224	43.7
Educational Qualification	First Year	230	44.9
	Second Year	282	55.1

Assessment of knowledge related to Hepatitis B

A lion's share of the participants was aware of Hepatitis B, correctly identifying it as a viral disease and acknowledging its ability to induce liver disease. Nevertheless, the level of knowledge regarding its connection to liver cancer and its influence on individuals of all age groups was significantly lower. A minor proportion of respondents possessed knowledge of common symptoms and may remain asymptomatic.

The level of preventative knowledge revealed variability, around half of the respondents exhibited awareness regarding vaccination, knowledge on mode of transmission and acknowledged the potential danger associated with unsterilized medical devices.

Many respondents demonstrated awareness of major transmission routes, including contact with contaminated blood, body fluids, and unsafe sexual practices. A considerable number also recognized that drug abusers are more susceptible and that monitoring such high-risk groups is important for prevention. However, misconceptions persisted, as some participants believed the virus could be transmitted through food, water, or shared living environments. Awareness of treatment was moderate, with several respondents acknowledging that hepatitis B is treatable and that timely therapy can help maintain good health.

There was a moderate level of awareness about treatment procedure for Hepatitis B being treatable and a considerable proportion believed it poses occupational challenges. Details of knowledge related questions are summarized in Table 2.

Table 2: Knowledge regarding Hepatitis B

Characteristics	Response	Frequency (n)	Percentage (%)
Have you ever heard of HBV?	Yes	411	80.3
	No	57	11.1
	No response	44	8.6
Is Hepatitis B is a viral disease?	Yes	301	58.8
	No	59	11.5
	No response	152	29.7
Can Hepatitis B cause liver disease?	Yes	259	50.6
	No	56	10.9
	No response	197	38.5
Can Hepatitis B cause liver cancer?	Yes	184	35.9
	No	57	11.1
	No response	271	52.9
Can Hepatitis B affect any age group?	Yes	291	56.8
	No	53	10.4
	No response	168	32.8
Is jaundice one of the common symptoms of Hepatitis B?	Yes	193	37.7
	No	72	14.1
	No response	247	48.2
Are nausea, vomiting and loss of appetite common symptoms of Hepatitis B?	Yes	228	44.5
	No	51	10.0
	No response	233	45.5
Do you know some patients of Hepatitis B may not have any symptom?	Yes	176	34.4
	No	74	14.5
	No response	262	51.2
Is there any vaccine to prevent Hepatitis B?	Yes	253	49.4
	No	69	13.5
	No response	190	37.1
Can Hepatitis B be transmitted by unsterilized syringes, needles and surgical instruments?	Yes	241	47.1
	No	67	13.1
	No response	204	39.8
Can Hepatitis B be transmitted by contaminated blood and blood products?	Yes	227	44.3
	No	60	11.7
	No response	225	43.9
Can Hepatitis B be transmitted by using blades of the barber or ear and nose piercing?	Yes	213	41.6
	No	82	16.0
	No response	217	42.4
Do drug addicted people has higher risk of HBV infection?	Yes	264	51.6
	No	50	9.8
	No response	198	38.7
Is there any necessity to test for HBV in drug addicted?	Yes	303	59.2
	No	53	10.4
	No response	156	30.5
Can Hepatitis B be transmitted by unsafe sex?	Yes	221	43.2
	No	60	11.7
	No response	231	45.1
Is there any necessity to test for HBV before marriage?	Yes	258	50.4
	No	49	9.6
	No response	205	40.0
Is there any problem to marry a HBsAg positive patient?	Yes	159	31.1
	No	77	15.0
	No response	276	53.9
Is there any precaution to be taken before marry a HBsAg positive patient?	Yes	211	41.2
	No	60	11.7
	No response	241	47.1
Can Hepatitis B be transmitted from mother to child during pregnancy or delivery?	Yes	206	40.2
	No	73	14.3
	No response	233	45.5
Is there any necessity of vaccination after birth of a child of HBV infected mother?	Yes	267	52.1
	No	66	12.9
	No response	179	35.0
Can Hepatitis B be transmitted by water/food prepared by person suffering with the infections?	Yes	155	30.3
	No	126	24.6
	No response	231	45.1
Can Hepatitis B be transmitted by sharing same house, washroom and toilet with the infected person?	Yes	161	31.4
	No	131	25.6
	No response	220	43.0
Is Hepatitis B curable/treatable?	Yes	235	45.9

	No	83	16.2
	No response	194	37.9
Can HBV infected patient stay healthy with treatment?	Yes	260	50.8
	No	64	12.5
	No response	188	36.7
Can HBsAg positive turn into negative by indigenous medication?	Yes	74	14.5
	No	225	43.9
	No response	213	41.6
Is specific diet required for the treatment of Hepatitis B?	Yes	194	37.9
	No	82	16.0
	No response	236	46.1
Is there any obstacle of HBV infected patients in working abroad?	Yes	158	30.9
	No	75	14.6
	No response	279	54.5
Is there any obstacle of HBV infected patients in working as army or police?	Yes	196	38.3
	No	53	10.4
	No response	263	51.4

Assessment of attitude towards Hepatitis B

Table 3 describes the participants' attitudes toward hepatitis B. Many students were uncertain about their personal risk of acquiring the infection, reflecting limited perceived susceptibility. In the event of experiencing symptoms, the majority expressed a preference for seeking care from qualified medical professionals rather than alternative sources. Emotional reactions to a potential diagnosis varied, with fear, surprise, and distress being commonly anticipated responses.

Concern about transmitting the infection to family members

emerged as the most prominent worry, outweighing fears related to cost, social isolation, or mortality. Most respondents indicated that they would discuss their condition primarily with a doctor, followed by family members, suggesting a generally positive attitude toward professional consultation. However, perceptions regarding the cost of diagnosis and treatment were largely unclear, with many students unsure about the financial implications, indicating uncertainty and apprehension surrounding access to care.

Table 3: Attitude regarding Hepatitis B

Characteristics	Response	Frequency (n)	Percentage (%)
Do you think you can get hepatitis B?	Yes	118	23.0
	No	94	18.4
	No response	300	58.6
What will you do if you think you have symptoms of hepatitis B?	Hakim/Kabiraj	10	2.0
	Homeopathic doctor	14	2.7
	Pharmacist	15	2.9
	Doctor/Hospital	440	85.9
	Others	33	6.4
What will be your reaction if you find that you have hepatitis B?	Get feared	114	28.1
	Get ashamed	22	4.3
	Get astonished	65	12.7
	Get depressed	55	10.7
	Others	226	44.1
What worries you most if you will be diagnosed with hepatitis B?	Fear of death	90	17.6
	Fear of spreading among family	252	49.2
	Fear of expense	43	8.4
	Fear of isolation	22	4.3
	Others	105	20.5
Who do you talk to about your disease?	Doctor	277	54.1
	Family member	133	26.0
	Relatives	33	6.4
	Friends	24	4.7
	Others	45	8.8
How expensive do you think about diagnosis and treatment of hepatitis B?	It's free	26	5.1
	Not much costly	48	9.4
	Little expensive	76	14.8
	Very expensive	52	10.2
	Don't know	310	60.5

Assessment of practice towards Hepatitis B

The analysis of the practices related to Hepatitis B among the participants summarized in Table 4 uncovers numerous crucial observations. The screening rates for Hepatitis B were significantly low. In contrast, vaccination coverage was high, largely attributable to the inclusion of

the hepatitis B vaccine in the Expanded Programme on Immunization. Preventive behaviors were moderately practiced, as many participants reported ensuring the use of new syringes before injections and requesting barbers to change blades.

Regarding healthcare-seeking behavior, a substantial proportion of respondents indicated that they would pursue further investigation and treatment if diagnosed with hepatitis B. Most participants did not report avoiding contact with individuals infected with hepatitis B, suggesting limited stigma at the social level. However, participation in hepatitis B-related health education programs was low, reflecting inadequate exposure to formal awareness initiatives.

Table 4: Practice regarding Hepatitis B

Characteristics	Response	Frequency (n)	Percentage (%)
Have you done screening for Hepatitis B?	No	476	93.0
	Yes	36	7.0
Have you got yourself vaccinated?	No	64	12.5
	Yes	448	87.5
Do you ask for a new syringe before use?	No	185	36.1
	Yes	327	63.9
Do you ask your barber to change Blade?	No	171	33.4
	Yes	341	66.6
In case you are diagnosed with Hepatitis B, would you go for further investigation and treatment?	No	142	27.7
	Yes	370	72.3
Do you avoid meeting Hepatitis B patients?	No	351	68.6
	Yes	161	31.4
Have you ever participated in health education program related to Hepatitis B?	No	439	85.7
	Yes	73	14.3

Categorization of knowledge attitude and practice (KAP) score and its association with baseline characteristics

Knowledge scores are categorized into two groups: less than 9 was considered poor knowledge while 9 or above was considered good knowledge. Around two-third of respondents demonstrated good knowledge regarding hepatitis B. The distribution of knowledge scores was similar across different age groups, showing no significant association between age and knowledge level. Likewise, knowledge scores did not differ significantly by sex or

family size.

In contrast, educational qualification showed a significant association with knowledge level. Participants with higher educational attainment were more likely to demonstrate better knowledge compared to those with lower qualifications. Additionally, point biserial correlation analysis indicated a negative correlation between increasing family size and knowledge scores. The details are summarized in Table 5.

Table 5: Association of knowledge score with demographic characteristics

Demographic characteristics	Knowledge score				χ^2 Test	p-value	
	< 9 (n=154)		≥ 9 (n=358)				
	n	%	n	%			
Age	15-18	127	82.5	293	81.8	0.028	0.866
	19-22	27	17.5	65	18.2		
Sex	Male	88	57.1	190	53.1	0.719	0.397
	Female	66	42.9	168	46.9		
Family Size	≤ 4	78	50.6	210	58.7	2.807	0.094
	> 4	76	49.4	148	41.3		
Educational Qualification	SSC Passed	82	53.2	148	41.3	6.169	0.013*
	HSC Passed	72	46.8	210	58.7		

* Statistically significant

Demographic characteristics	Correlation coefficient (Point biserial correlation)
Age category	0.034
Family size	-0.119*

*Correlation is significant

Correlation of knowledge and practice on Hepatitis B:

Higher knowledge levels were significantly associated with practices, including vaccination status (p=0.016), requesting new syringes (p=0.000), asking barbers to change blades (p=0.001), seeking further investigation and treatment following a hepatitis B diagnosis (p=0.000), and participation in health education programs (p=0.028).

In contrast, no significant association was observed between knowledge scores and prior screening for hepatitis B or contact with infected individuals.

Table 6: Association of knowledge score with individual practice

Practice		Knowledge score				χ^2 Test	p-value
		< 9 (n=154)		≥ 9 (n=358)			
		n	%	n	%		
Have you done screening for Hepatitis B?	No	145	94.2	331	92.5	0.475	0.491
	Yes	9	5.8	27	7.5		
Have you got yourself vaccinated?	No	143	92.9	305	85.2	5.779	0.016*
	Yes	11	7.1	53	14.8		
Do you ask for a new syringe before use?	No	84	54.5	101	28.2	32.356	0.000*
	Yes	70	45.5	257	71.8		
Do you ask your barber to change Blade?	No	67	43.5	104	29.1	10.117	0.001*
	Yes	87	56.5	254	70.9		
In case you are diagnosed with Hepatitis B, would you go for further investigation and treatment?	No	67	43.5	75	20.9	27.336	0.000*
	Yes	87	56.5	283	79.1		
Do you avoid meeting Hepatitis B patients?	No	113	73.4	238	66.5	2.376	0.123
	Yes	41	26.6	120	33.5		
Have you ever participated in health education program related to Hepatitis B?	No	140	90.9	299	83.5	4.810	0.028*
	Yes	14	9.1	59	16.5		

* Statistically significant

Discussion

Hepatitis B virus infection remains a major global public health concern, threatening millions of lives each year. Alongside ongoing control efforts and vaccination programs, improving public education and awareness about this infectious disease is essential. This study assessed knowledge, attitudes, and practices related to Hepatitis B among college students in Rajshahi City, Bangladesh, and identified associations between knowledge levels, demographic factors, and health behaviors.

Although most participants had tertiary or higher education, their overall knowledge of HBV infection was inadequate. Knowledge levels were significantly associated with educational attainment, while no meaningful associations were observed with age, sex, or family size, suggesting limited influence of these factors. Existing evidence indicates that socioeconomic factors, particularly education and income, are strongly linked to health-related knowledge. Consistent with this, our findings showed a positive association between educational level and HBV knowledge, in line with previous studies from Bangladesh, India, and Jordan [11, 7, 16].

The analysis of individual practices showed significant associations between higher knowledge scores and positive behaviors, including vaccination, requesting new syringes, asking barbers to change blades, seeking further investigation and treatment after diagnosis, and participation in health education programs. These findings suggest that better knowledge supports a proactive approach to hepatitis B prevention and management. Conversely, no significant associations were found between knowledge scores and whether individuals have been screened for Hepatitis B or avoid meeting Hepatitis B patients. This indicates that while knowledge influences certain proactive health behaviors, it may not necessarily translate into all preventive actions or behaviors related to social stigma. Low screening rates may be due to fear of diagnosis or limited perceived risk among participants [17]. Vaccination remains an effective strategy for preventing HBV infection and reducing disease burden [18].

The findings underscore the importance of educational interventions to enhance knowledge and promote proactive health behaviors related to Hepatitis B. Given the significant association between educational qualification and knowledge scores, incorporating comprehensive Hepatitis B education into school curricula could be a crucial step towards improving awareness and preventive practices among young populations. Additionally, targeted health education programs that address specific knowledge gaps and misconceptions about Hepatitis B transmission and prevention could further enhance understanding and encourage protective behaviors.

The study reveals that a substantial proportion of students hold misconceptions about Hepatitis B transmission, with 30.3% believing it can be transmitted by food or water and 31.4% thinking it can be spread through shared living areas. These misconceptions contribute to social stigma and isolation of Hepatitis B patients, as indicated by the finding that 68.6% of respondents avoid meeting Hepatitis B patients. Public health campaigns need to focus on correcting these misconceptions and reducing stigma to ensure better social support and integration for individuals with Hepatitis B. Future research should explore to understand the barriers to screening and other preventive

behaviors. This can help in designing more effective educational interventions to provide valuable long-term impact on preventive healthcare.

Conclusion

In conclusion, this study emphasizes the importance of educational attainment in improving hepatitis B knowledge and proactive health behaviors among college students in Rajshahi City, Bangladesh. Although higher knowledge was associated with several positive practices, misconceptions and social stigma remain common. Public health efforts should prioritize educational interventions to enhance knowledge, address misconceptions, and reduce stigma, thereby improving health outcomes and supporting the global goal of hepatitis B elimination by 2030.

Conflict of interest

The authors declare no conflict of interest.

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Data availability

The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

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