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Knowledge of Hepatitis-B Management and its Prevention among the Senior Staff Nurses Working at Bangabandhu Sheikh Mujib Medical University (BSMMU)

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Research Article

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Abstract

Background: Hepatitis B, caused by the Hepatitis B virus (HBV), presents a significant global health challenge, especially in regions like Bangladesh where its prevalence is intermediate. The virus is transmitted through percutaneous or mucosal exposure to infectious blood or bodily fluids, posing a substantial risk to healthcare workers. Hepatitis B can lead to severe liver diseases if untreated. In Bangladesh, the burden of Hepatitis B is high, necessitating urgent intervention, particularly among healthcare professionals such as senior staff nurses who are on the frontline of managing and preventing the disease.

Methods: This cross-sectional study assessed the knowledge levels of 210 senior staff nurses at Bangabandhu Sheikh Mujib Medical University (BSMMU) regarding Hepatitis B management and prevention. A structured questionnaire, translated into Bengali, was used for data collection through structured interviews. Convenience sampling was employed, and data were analyzed using SPSS (Version 24.0). Descriptive statistics and t-tests/ANOVA were used to explore the relationship between socio-demographic characteristics and nurses' knowledge about Hepatitis B. Ethical clearance was obtained from the Institutional Review Board (IRB) of BSMMU.

Results: The majority of respondents were female (70%), aged below 30 years (59.5%), and had basic nursing education (89.5%). Most had 1-10 years of work experience (89%) and earned less than 35,000 BDT monthly (78.1%). Regarding vaccination, 64.3% had completed it, 26.7% were partially vaccinated, and 9% were unvaccinated. Occupational exposure to blood or body fluids was reported by 73.3% of nurses. Knowledge about Hepatitis B infection, transmission, and prevention was generally high, with 85.44%, 89.14%, and 85.11% of nurses demonstrating good knowledge in these areas, respectively. Marital status and vaccination status were significantly associated with higher knowledge levels ($p < 0.05$).

Conclusion: Senior staff nurses at BSMMU exhibit substantial knowledge about Hepatitis B infection, transmission, and prevention. However, misconceptions persist regarding non-transmission routes and some preventive measures. Married nurses and those with complete vaccination status demonstrated higher knowledge levels. These findings highlight the need for targeted educational interventions to address knowledge gaps and reinforce preventive practices among nurses. This study underscores the importance of continuous education and vaccination programs to enhance the effectiveness of Hepatitis B management and prevention efforts in healthcare settings.

Keyword: Hepatitis B; Knowledge about Hepatitis B; Prevention about Hepatitis B; Nurse; Bangladesh

Abbreviations

HBV: Hepatitis B Virus; BSMMU: Bangabandhu Sheikh Mujib Medical University; IRB: Institutional Review Board; PPE: Personal Protective Equipment; HSE: Health Service Executive.

Introduction

Hepatitis B, caused by the Hepatitis B virus (HBV), stands as a formidable global public health challenge, particularly in regions like Bangladesh where its prevalence falls in the intermediate range. The transmission of this virus primarily occurs through percutaneous or mucosal exposure to infectious blood or bodily fluids [1], posing a substantial risk not only to the general populace but also to healthcare workers [2] who are consistently in contact with infected individuals. Hepatitis B manifests as acute illness, exhibiting symptoms ranging from mild discomfort to severe liver failure [3], and if left untreated, it can progress to chronic infection, potentially leading to debilitating conditions such as cirrhosis and liver cancer [4,5].

In Bangladesh, the burden of Hepatitis B looms large, affecting millions across the nation. Alarmingly, studies conducted in hospitals in Dhaka, the capital city, have reported a high prevalence of acute HBV cases [3-7], underlining the pressing need for urgent intervention. Among the healthcare professionals grappling with this challenge, senior staff nurses emerge as frontline warriors, playing a pivotal role in the management and prevention of Hepatitis B due to their close and continuous interaction with infected patients [8]. It is imperative to comprehend their knowledge levels and the factors influencing their practices to develop targeted interventions aimed at combatting the disease effectively.

Understanding the knowledge gaps and barriers faced by senior staff nurses is paramount to designing effective strategies to combat Hepatitis B effectively. By shedding light on these issues, this study endeavours to assess the knowledge levels of senior staff nurses at Bangabandhu Sheikh Mujib Medical University (BSMMU) concerning Hepatitis B management and prevention. By discerning the influencing factors and determinants of knowledge acquisition and vaccination practices among this demographic, the research aimed to lay the groundwork for the development of context-specific policies and interventions tailored to the unique challenges faced by Bangladesh in combatting Hepatitis. Ultimately, the goal is to contribute to the eradication of Hepatitis B and alleviate the burden of liver diseases in the country, ensuring a healthier and more prosperous future for all Bangladeshis.

Methods

This study adopted a quantitative approach, employing a cross-sectional study design to investigate selected variables among the target population. This research was carried out at Bangabandhu Sheikh Mujib Medical University (BSMMU), focusing on its Medical, Surgical, Gynecology, and Orthopedic departments, with registered senior staff nurses comprising the study population. The sample size of 210 registered nurses from BSMMU was determined by using a standard formula, ensuring a representative sample for robust analysis. Convenience sampling was employed for data collection due to practical considerations and accessibility. Data was gathered through structured interviews using a questionnaire, ensuring strict confidentiality and anonymity. Ethical clearance was obtained from the Institutional Review Board (IRB) of BSMMU before initiating the study to ensure adherence to ethical standards. Data analysis involved the meticulous checking, coding, and utilization of the SPSS software package (Version 24.0), with descriptive statistics facilitating comprehensive data interpretation. The study was lasted for one year. Collaboration with the Ministry of Health and Family Welfare and the University Grant Commission was sought to ensure support and coordination throughout the research process. In addition to this, both written and verbal consent was sought from the respondents prior to data collection. In order to avoid error in data collection and

the miscommunication, questionnaire and consent form was translated into Bengali for the better understanding of participants.

Results

In this chapter, the findings based on the study subjects' respond can be noticed systematically. This includes in the order of the socio-demographic characteristics of the participants, occupational exposure history of the respondents, knowledge of the participants about Hepatitis B virus infection and prevention, and the relationship between the socio-demographic characteristics and nurses' knowledge about Hepatitis B virus infection and prevention.

Variables	Categories	N	%
Age (Years)	<30 years	125	59.5
	31 – 40 years	71	33.8
	>40 years	14	6.7
Sex	Male	63	30
	Female	147	70
Religion	Islam	147	70
	Hindu	53	25.2
	Christian	10	4.8
Marital Status	Single	65	31
	Married	145	69
Professional Education	Basic education in nursing	188	89.5
	Higher education in nursing	22	10.5
Working Experience (Years)	1 – 10 years	187	89
	11 – 20 years	16	7.6
	21 – 30 years	7	3.3
Monthly Income (In Bangladeshi Taka)	< 35000	164	78.1
	> 35000	46	21.9
Vaccination Status	Not taken	19	9
	Completed	135	64.3
	Partially complete	56	26.7

Table 1: Distribution of socio-demographic characteristics of nurses (N = 210).

The distribution of socio-demographic characteristics among the nurses surveyed (N = 210) reveals several notable trends in Table 1. A significant portion of the respondents were younger, with 59.5% aged below 30 years, while 33.8% fall within the 31-40 age range, and only 6.7% are over 40 years old. Additionally, the majority of the nurses were female (70%) and adhered to the Islamic faith (70%). Regarding marital status, significant proportions were married (69%), and the majority had basic education in nursing (89.5%) as opposed to higher education (10.5%). In terms of work experience, most nurses had between 1 to 10 years of experience (89%), with fewer having 11 to 20 years (7.6%) or 21 to 30 years (3.3%) of experience. Moreover, a majority of respondents earned a monthly income of less than 35,000 BDT (78.1%). Regarding vaccination status, a substantial proportion of nurses completed their vaccination (64.3%), while 26.7% had partially completed it, and 9% did not take the vaccine.

Variables	Response (Yes)	
	N	%
Exposure to blood or body fluids in intact skin	154	73.3
Splash of blood or body fluids in eye or mouth	42	20
Splash of blood on cuts or unprotected skin	78	37.1

Table 2: Distribution of respondents according to occupational exposure history (N = 210).

Table 2 illustrates a substantial majority of respondents (73.3%) reported experiencing exposure to blood or body fluids on intact skin. Additionally, a notable proportion of respondents' reported incidents of splashes of blood or body fluids in their eyes or mouth (20%). Furthermore, a considerable portion of respondents encountered splashes of blood on cuts or unprotected skin (37.1%).

Variables	Respondents (%)	
	Yes	No
Asymptomatic for long time	184(87.6)	26(12.4)
Highly infectious disease	185(88.1)	25(11.9)
Diagnosed by blood test	208(99)	2(1)
Found in semen or vaginal fluid	177(84.3)	33(15.7)
Found in oral mucosa	76(36.2)	134(63.8)
Small proportion infected with hepatitis B virus	66(31.1)	144(68.6)
Only affect liver	183(87.1)	27(12.9)
Great public health problems in Bangladesh	197(93.8)	13(6.2)
Reconnendate for all and health care workers	203(96.7)	7(3.3)

Table 3: Knowledge about Hepatitis B virus infection (N = 210).

The statistics from Table 3, which illustrate the knowledge about Hepatitis B virus infection among the respondents (N = 210). A significant majority (87.6%) did understand that Hepatitis B can be asymptomatic for a long time, and 88.1% recognized it as a highly infectious disease. Nearly all respondents (99%) were aware that Hepatitis B can be diagnosed through a blood test. Moreover, 84.3% of respondents correctly identified that the virus can be found in semen or vaginal fluid. However, knowledge about the presence of the virus in oral mucosa was less widespread, with only 36.2% acknowledging this fact. Additionally, a smaller proportion (31.1%) believed that only a small proportion of people are infected with Hepatitis B. Most respondents (87.1%) knew that Hepatitis B primarily affects the liver, and a substantial majority (93.8%) recognized it as a significant public health problem in Bangladesh. Lastly, an overwhelming majority (96.7%) recommended vaccination for everyone, including healthcare workers.

Variables	Respondents (%)	
	Yes	No
Transmitted through sharps instruments	196(93.3)	14(6.7)
Transmitted by blood donation	206(98.1)	4(1.9)
Transmitted by sexual intercourse	198(94.3)	12(5.7)
Transmitted by mother to child	182(86.7)	28(13.3)
Transmitted by contaminated water	56(26.7)	154(73.3)
Transmitted by blade/razor	185(88.1)	25(11.9)

Table 4: Knowledge about hepatitis B virus transmission (N = 210).

The data from Table 4, which presents the knowledge about Hepatitis B virus transmission among the respondents (N = 210). A significant majority (93.3%) correctly identified that Hepatitis B can be transmitted through sharp instruments, and an even higher percentage (98.1%) were aware that blood donation can be a transmission route. Additionally, 94.3% recognized that sexual intercourse is a mode of transmission. Furthermore, a substantial majority (86.7%) understood that mother-to-child transmission is possible. A noteworthy finding is that only 26.7% of respondents mistakenly believed that Hepatitis B can be transmitted through contaminated water, indicating that a majority (73.3%) correctly understood that this is not a transmission route for Hepatitis B. Additionally, 88.1% of the respondents knew that using a contaminated blade or razor can transmit the virus.

Variables	Respondents (%)	
	Yes	No
Prevented by vaccination	200(95.2)	10(4.8)
Proper disposal of sharp instruments	203(96.7)	7(3.3)
Avoiding of multi-sexual partner	203(96.7)	7(3.3)
Avoiding contaminated drinking water	115(54.8)	95(45.2)
Avoiding uncooked food	57(27.1)	153(72.9)
Using gloves	198(94.3)	12(5.7)
Proper sterilization	199(94.8)	11(5.2)

Table 5: Knowledge about hepatitis B virus prevention (N = 210).

The statistics from Table 5, which outline the knowledge about Hepatitis B virus prevention among the respondents (N = 210). An overwhelming majority (95.2%) understood that Hepatitis B can be prevented through vaccination, and 96.7% recognized the importance of proper disposal of sharp instruments in preventing transmission. Similarly, 96.7% were aware that avoiding multiple sexual partners is a preventive measure. The use of gloves as a preventive measure was acknowledged by 94.3% of respondents and 94.8% understood the necessity of proper sterilization to prevent the spread of Hepatitis B. However, there were notable misconceptions regarding other preventive measures. Over half of the respondents (54.8%) incorrectly believed that avoiding contaminated drinking water is a method to prevent Hepatitis B, and 27.1% mistakenly thought that avoiding uncooked food can prevent the virus.

Variables	Categories	T/F(p)
Age (Years)	<30 years	1.57(0.57)
	31 – 40 years	
	>40 years	
Sex	Male	0.06(0.96)
	Female	
Religion	Islam	0.49(0.63)
	Hindu	
	Christian	
Marital status	Single	-2.29(0.02)*
	Married	
Professional education	Basic education in nursing	1.12(0.26)
	Higher education in nursing	
Working experience (years)	1 – 10 years	0.99(0.37)
	11 – 20 years	
	21 – 30 years	
Monthly income	< 35000	1.12(0.26)
	> 35000	
Vaccination status	Completed	8.86(0.000)*
	Partially complete	
	Not taken	

Table 6: Relationship between Socio-demographic Characteristics and nurses' knowledge about hepatitis B virus infection, transmission and prevention (N = 210).

Table 6 presents the relationship between socio-demographic characteristics and nurses' knowledge about Hepatitis B virus infection, transmission and prevention. An independent t-test was employed to assess the relationship between age, sex, marital status, professional education, and monthly income with nurses' knowledge. Additionally, Analysis of Variance (ANOVA) was conducted to explore the relationship between religion, working experience, and vaccination status with nurses' knowledge. Among these characteristics, marital status ($p = 0.02$) and vaccination status ($p = 0.000$) are found to be statistically significant in relation to nurses' knowledge about Hepatitis B. Specifically, the findings reveal that marital status is significantly associated with nurses' knowledge ($t = -2.29$, $p < 0.05$), indicating that married nurses possess higher knowledge about Hepatitis B compared to single nurses. Moreover, vaccination status showed a significant difference in knowledge levels ($F = 8.86$, $p < 0.001$).

Discussion

Socio-Demographic Characteristics of the Respondents

The study assessed the knowledge of Hepatitis B virus (HBV) infection among senior staff nurses at Bangabandhu Sheikh Mujib Medical University (BSMMU) in Bangladesh, involving 210 participants. The results indicate that a significant portion of respondents were young, with 59.5% aged below 30 years. This is consistent with a study conducted in Sudan [9] where the majority of nurses (65.5%) were also under 30 years of age. Similarly, a Nigerian study found that more than half of the respondents (59%) were less than 34 years old [10]. In the present study, 69% of the nurses were married, which aligns with findings from prior studies [7,10], where a majority of the nurses were also married.

The educational background of the respondents revealed that about 90% had basic nursing education, similar to findings by a previous author [11] who reported that approximately 90% of Bangladeshi nurses held a diploma degree. This suggests an ongoing effort among nurses to upgrade their professional qualifications, as highlighted by Lu and colleagues in 2007 [12]. Most nurses (89%) had 1 to 10 years of working experience, paralleling results from a study in Cameroon, Africa, where nearly 70% of nurses had similar experience levels [13]. Furthermore, 64.3% of the nurses had received the Hepatitis B vaccine, closely matching the 56.5% vaccination rate reported by another author [7]. This indicates a substantial level of vaccination coverage among Bangladeshi nurses.

Occupational Exposure History of the Respondents

The study found that 73.3% of nurses had been exposed to blood or body fluids on intact skin, indicating a high level of occupational exposure. This finding aligns with a study in Africa where 85% of nurses reported similar exposure [13]. The significant exposure to body fluids highlights the occupational hazards nurses face and underscores the importance of stringent protective measures to prevent HBV transmission. The Health Service Executive (HSE) Southern Area of Ireland recommends protective measures for healthcare workers to prevent body fluid exposure, including stringent hand hygiene, covering broken skin, and using personal protective equipment (PPE) like gloves, aprons, gowns, masks, eye protection, and enclosed footwear [14]. These standard precautions minimize cross-infection risks from all body fluids, non-intact skin, and mucous membranes, ensuring a basic level of infection control and safeguarding both healthcare workers and patients.

Knowledge of the Participants about Hepatitis B Virus Infection, Transmission and Prevention

The study assessed nurses' knowledge of HBV infection, transmission, and prevention. The findings revealed that 85.44%, 89.14%, and 85.11% of nurses possessed good knowledge about HBV infection, transmission, and prevention, respectively. These results align with the findings of a previous research [7], conducted among nurses in Bangladesh. Conversely, a similar study conducted in Pakistan depicted poor knowledge about HBV infection among its participants [15]. The difference in findings between the current study and the Pakistan-based study can be attributed to the fact that healthcare professionals, such as nurses, generally possess more accurate knowledge about HBV than the general population.

In a prior study conducted in Dhaka [7], respondents demonstrated knowledge of HBV transmission through unsafe sex (88%), infected blood transfusion (98%), needle sharing (98.7%), and using the same razor or piercing/tattooing object (86%). Similarly, the current study found that nurses were aware of these transmission routes: unsafe sex (94.3%), infected blood transfusion (98.1%), needle sharing (93.3%), and using the same razor or piercing/tattooing object (88.1%). Additionally, the present study showed that 86.7% of respondents knew about the potential HBV transmission route from mother to child, a detail not covered in the earlier study [7]. This discrepancy may be attributed to the use of different types of questionnaires.

Several studies have investigated the existing knowledge regarding preventive practices of HBV among nurses in Bangladesh and globally. A prior study in Bangladesh revealed that nearly three quarters of participants had poor knowledge about HBV prevention activities [16], contrasting with the present study where a significant majority demonstrated good knowledge. This discrepancy may be attributed to the experience of the target population, as the present study focused on senior staff nurses. Notably, both studies found that nearly all participants were aware that HBV vaccination is the principal measure to combat this disease. However, only 64.3% of the present study's respondents and 59% of respondents from an earlier study had taken the HBV vaccination. This highlights the need for behavioral training to enhance the implementation of preventive activities based on the gained knowledge among the nurse population in Bangladesh.

Comparing the current study with similar studies conducted in Pakistan [17] and Saudi Arabia [17], it is evident that nurses in these regions also exhibit good knowledge of HBV prevention activities, akin to the findings of the present study. The Pakistan-based study highlighted that 65.8% of nurses got screened for HBV, and 55.8% were vaccinated. Additionally, 95.8% avoided needle sharing, and 45.8% changed gloves before every sampling. Among 120 nurses, 42.5% reported needle prick incidents to health authorities.

In contrast, the current study revealed even higher levels of awareness and preventive practices. An overwhelming majority (95.2%) of nurses understood that Hepatitis B could be prevented through vaccination, and 96.7% recognized the importance of proper disposal of sharp instruments in preventing transmission. Additionally, 96.7% acknowledged avoiding multiple sexual partners as a preventive measure. The use of gloves was recognized by 94.3% of respondents, and 94.8% understood the necessity of proper sterilization to prevent HBV spread.

However, notable misconceptions persist among the respondents in the current study. Over half (54.8%) incorrectly believed that avoiding contaminated drinking water is a method to prevent HBV, and 27.1% mistakenly thought that avoiding uncooked food could prevent the virus. These misconceptions indicate areas where further education is needed to ensure comprehensive understanding of HBV prevention among healthcare professionals.

The similarities in findings across different regions underscore the effectiveness of existing educational and preventive measures among nurses. However, the differences, particularly in misconceptions and specific preventive practices, highlight the need for tailored educational programs to address these gaps and enhance the overall knowledge and preventive behaviours related to HBV.

Relationship between Socio-Demographic Characteristics and Nurses' Knowledge about Hepatitis B Virus Infection, Transmission and Prevention

The relationship between socio-demographic characteristics and nurses' knowledge about HBV infection, transmission, and prevention is crucial for understanding the factors that enhance or impede effective healthcare delivery. The current study's findings reveal that marital status and vaccination status are significantly associated with nurses' knowledge about HBV. Married nurses demonstrated higher knowledge scores compared to single nurses ($t = -2.29$, $p < 0.05$), suggesting that married individuals may benefit from increased life experience and responsibility, which contribute to a deeper understanding of HBV. Furthermore, nurses who completed their vaccination regimen exhibited significantly higher knowledge levels ($F = 8.86$, $p < 0.001$), underscoring the importance of vaccination in promoting awareness and knowledge about HBV.

While the present study indicates that marital status and vaccination status are positively correlated with higher knowledge levels about HBV among nurses, this relationship is not uniformly observed across different contexts. For instance, a previous research found that being married was significantly associated with poor practices of HBI prevention (aOR = 0.320, 95% CI: 0.13–0.82) among Bangladeshi nursing students [17]. This discrepancy suggests that despite higher knowledge, married nurses might not necessarily translate their knowledge into better preventive practices. Additionally, while vaccination status significantly impacts knowledge levels ($F = 8.86$, $p < 0.001$) according to the present study, as aligned with findings from a similar setting in Pakistan, but a Bangladesh based study reported no significant association among these two variables [16]. In addition, it [16] highlighted no association between knowledge and socio-demographic factors such as age, marital status, educational level, and monthly income in Bangladesh likewise this study. However, significant associations were found with gender and religion in their study, which were also highlighted by a prior author [7] alongside monthly family income. These variances indicate the complexity of socio-demographic influences and suggest that targeted interventions should consider these nuanced relationships to effectively enhance nurses' knowledge and practices related to HBV prevention.

Conclusion

This study reveals significant insights into the knowledge levels of senior staff nurses at Bangabandhu Sheikh Mujib

Medical University (BSMMU) concerning Hepatitis B virus (HBV) infection, transmission, and prevention. The findings indicate that nurses possess a good understanding of HBV, particularly regarding its diagnosis, transmission routes, and prevention methods. However, misconceptions persist, particularly about HBV's transmission through contaminated water and uncooked food. The study underscores the importance of marital and vaccination status in influencing nurses' knowledge levels, with married and fully vaccinated nurses demonstrating higher awareness. This highlights the critical role of life experience and professional practices in enhancing healthcare workers' knowledge and readiness to combat HBV.

Recommendations

Based on the study findings, several recommendations are proposed to improve the understanding and management of Hepatitis B Virus (HBV) among healthcare workers. Firstly, comprehensive training programs should be developed to address specific knowledge gaps and misconceptions about HBV, particularly its transmission and prevention. Secondly, robust vaccination campaigns must be implemented, targeting healthcare workers to ensure complete vaccination coverage, as this is significantly associated with higher knowledge levels. Additionally, educational interventions should consider the unique needs and responsibilities of married nurses, leveraging their experience to enhance overall knowledge and practice. Continuous education initiatives are also essential, keeping healthcare workers updated on the latest HBV management and prevention strategies to ensure sustained knowledge enhancement. Finally, collaboration with health authorities is crucial to develop policies that mandate regular training and vaccination for healthcare workers, thereby standardizing preventive practices across medical institutions.

Limitations

This study has several limitations that should be acknowledged. The use of convenience sampling might limit the generalizability of the findings to all senior staff nurses in Bangladesh, as it may not fully represent the entire population. Reliance on self-reported data for assessing knowledge and practices might introduce response bias, as participants may overestimate their knowledge or adherence to preventive measures. Additionally, the cross-sectional nature of the study provides only a snapshot of knowledge and practices at a single point in time, limiting the ability to assess changes or trends over time. The study's focus on a single medical university may also limit the applicability of the findings to other healthcare settings with different demographics or resource availability. Furthermore, the influence of cultural factors on knowledge and practices was not extensively explored, which could provide deeper insights into the socio-demographic determinants of HBV-related knowledge.

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