

Health care professionals' knowledge, attitudes, and behaviors around Hepatitis B virus infection

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Abstract

Background:

Hepatitis B virus (HBV) remains a significant global public health concern, affecting approximately 10% of the global population and leading to over 1 million deaths annually. Healthcare professionals (HCPs) face elevated occupational risks of HBV exposure due to contact with infectious materials. Effective vaccination and adherence to preventive measures can mitigate these risks, yet knowledge, attitudes, and practices (KAP) among HCPs vary, often influenced by professional roles and training.

Methods

This study was conducted at a 400-bed teaching hospital. Using simple random sampling, 297 HCPs participated by completing a self-administered questionnaire. Data were analyzed using SPSS version 20.1, with descriptive statistics and binary logistic regression applied to explore associations between variables.

Results:

Of the 297 participants, 73.1% demonstrated good knowledge about HBV transmission, progression, and vaccination. The majority (94.6%) perceived HBV as a significant health concern, and 94% recognized the importance of vaccination. Work overload and time pressures were identified as primary reasons for occupational HBV exposure. Multivariate regression revealed that medical doctors were 8.4 times more likely to have better knowledge compared to other HCPs (adjusted odds ratio = 8.399, CI = 1.536–45.936).

Conclusion:

HCPs exhibited good overall knowledge and positive attitudes toward HBV and its vaccination, with medical doctors showing significantly higher levels of awareness. However, work-related stressors contributing to exposure highlight the need for tailored training and preventive interventions to improve safety protocols and vaccine uptake among all healthcare roles.

Introduction

Hepatitis B virus (HBV) remains a significant global public health challenge, impacting approximately 10% of the global population. The World Health Organization (WHO) reported in 2009 that about 2 billion individuals

worldwide had been exposed to HBV, with over 350 million experiencing chronic, lifelong infection. Each year, over 1 million deaths are attributed to complications such as liver cancer and cirrhosis (1–3). HBV is notably prevalent among Black populations (2) and continues to pose a serious health concern in many regions (4–8).

Healthcare professionals (HCPs) are particularly vulnerable to HBV infection due to their occupational exposure (1, 3, 9). Research indicates that HCPs face up to four times greater risk of contracting HBV compared to the general population (10). The primary mode of transmission in healthcare settings is through direct contact with infectious materials, such as HBV-positive blood or exposure via needle-stick injuries involving contaminated fluids. Activities such as recapping used needles further elevate the risk of such injuries. These exposures not only compromise the physical safety of HCPs but can also have psychological repercussions, including heightened levels of anxiety and depression. Consequently, occupational exposure has implications not only for the health of HCPs but also for the quality of care they provide (11). Furthermore, low rates of vaccination among hospital staff exacerbate the problem, particularly for those at high risk of HBV exposure (2).

Inadequate awareness of HBV among HCPs has been highlighted as a contributing factor to the lack of preventive measures against blood-borne infections (12). It is crucial for HCPs to adhere to "universal precautions," as defined by the Centers for Disease Control and Prevention (CDC). These precautions assume that all blood and certain bodily fluids may carry pathogens such as HBV and outline measures to prevent their transmission during healthcare delivery (13).

An effective HBV vaccine has been available for approximately two decades and has demonstrated significant success in preventing HBV infection and its associated complications, including cirrhosis and liver cancer, whether administered pre- or post-exposure. With a protective efficacy of 90%–95%, the vaccine is considered safe and reliable, offering long-term and potentially lifelong protection to fully immunized individuals. Additionally, post-exposure prophylaxis combining hepatitis B immunoglobulin and the vaccine can mitigate the risk of infection following exposure to potentially infectious materials. However, pre-exposure vaccination and adherence to standard safety protocols remain the most cost-effective preventive measures (1, 3, 14).

Adequate knowledge and appropriate attitudes toward HBV are essential for minimizing occupational risks. However, the level of knowledge, attitudes, and practices (KAP) related to HBV and its vaccination varies among HCPs. Research has indicated that many HCPs lack sufficient understanding of HBV infection and vaccination (15, 16). Prevention efforts often reflect the broader societal prioritization of health-related issues, as knowledge, attitudes, and practices directly influence the effectiveness of such measures (13).

Studies assessing the KAP of HCPs regarding HBV and its vaccination are limited in certain regions. This research seeks to evaluate the level of knowledge and attitudes among HCPs working in a teaching hospital and identify factors that influence their understanding of HBV infection and vaccination.

Methods

The research was carried out in a teaching hospital equipped with over 400 beds and offering services across multiple departments, including pediatrics, surgery, gynecology, psychiatry, dermatology, dentistry, ophthalmology, pharmacy, and medical laboratory services. The hospital employs 943 healthcare workers (HCWs). HCPs who were unavailable during the study or chose not to participate were excluded. The study involved 297 participants, selected through a simple random sampling method.

Data Collection and Handling

The data collection tool was a structured format designed after reviewing relevant literature. It included sections on sociodemographic information, history of HBV exposure, and questions assessing knowledge and attitudes toward HBV and its vaccination. The tool underwent a pretest on 5% of the study population to identify and correct inconsistencies prior to the main study. Data were gathered using a self-administered questionnaire in English. Three graduating pharmacy students, trained over one day, facilitated data collection, with the principal investigator overseeing the process to ensure data accuracy and completeness daily.

Data Analysis

SPSS version 20.1 (IBM Corporation, Armonk, NY, USA) was used to process and analyze the data. Descriptive statistics were calculated, and frequency distribution tables were generated to summarize findings. Binary logistic regression was applied to explore associations between dependent and independent variables, with crude and adjusted odds ratios calculated. A p-value of <0.05 was considered statistically significant

- **Good knowledge:** Correct responses to more than 60% of the knowledge-related questions.
- **Poor knowledge:** Correct responses to less than 60% of the knowledge-related questions.
- **Positive attitude:** At least 60% of attitude-related questions answered positively.
- **Negative attitude:** Less than 60% of attitude-related questions answered positively.

Results

A total of 297 healthcare professionals (HCPs) participated in the study. Table 1 highlights that the majority of respondents were male (63.6%). The ages of participants ranged from 21 to 58 years, with a mean age of 26.91 ± 4.65 years. Regarding their professional background, most were nurses (33%) or medical doctors (31.3%). A significant proportion of participants (84.2%) had attained a bachelor's degree, and three-quarters (75.1%) reported having less than five years of professional experience.

Around 73.1% of respondents demonstrated a good understanding of HBV transmission, progression, and vaccination. The primary source of information for most participants was formal education (83.5%), followed by training (30.6%) and online resources (17.2%). Table 2 reveals that nearly all participants (92.9%) were aware that HBV could be spread through infected blood. However, only 24.2% recognized that urine is not a source of HBV transmission. Additionally, approximately 21.5% were unaware of the number of doses needed for complete immunization against HBV.

a vast majority (94.6%) strongly agreed or agreed that HBV is a significant public health concern. Most participants (91.3%) believed their job increased their risk of contracting HBV. Furthermore, 94% of respondents emphasized the importance of receiving the hepatitis B vaccine.

About half (49.2%) of the HCPs reported being exposed to conditions that posed a risk of HBV infection. Commonly cited reasons for such exposures were being overwhelmed with work (47.3%) and working under time pressure (45.2%). the most frequently adopted post-exposure measure was cleaning the affected area with soap, water, and antiseptic (48.6%).

Table 1. Sociodemographic and occupational characteristics of HCPs

Variable	Category	Frequency (%)
Age group (years)	21–29	246 (82.8)
	30–39	42 (14.1)
	>40	9 (3)
Sex	Male	189 (63.6)
	Female	108 (36.4)
Marital status	Single	198 (66.7)
	Married	99 (33.3)
Religion	Orthodox	230 (77.4)
	Muslim	28 (9.4)
	Protestant	30 (10.1)
	Others ^a	9 (3.0)
Profession	Medical doctor	93 (31.3)
	Nurse	98 (33)
	Pharmacist	36 (12.1)
	Lab technologist	26 (8.8)
	Midwives	21 (7.1)
	Health officer	7 (2.3)
	Others ^b	16 (6.0)
Educational level	Certificate	6 (2.0)
	Diploma	9 (3.4)
	First degree	250 (84.2)
	Master degree	23 (7.7)
	Specialist	9 (3)
Department of work	Surgery	36 (12.1)
	Laboratory	28 (9.4)
	Delivery unit	30 (10.1)
	Emergency department	15 (5.1)
	Internal medicine department	76 (25.6)
	Pediatrics	57 (19.2)
	Pharmacy unit	16 (5.4)
	Gynecology and obstetrics	13 (4.4)
	Others ^c	26 (8.8)
Work experience (years)	<5	223 (75.1)
	≥5	74 (24.9)

^a Catholic, atheist, and Hindu;

^b health officer, anesthesia, dentist, physiotherapies, psychiatry nurse;

^c dental department, oncology, optometry, psychiatry ward, recovery, general ward.

Abbreviation: HCPs, health care professionals.

Table 2. Knowledge of HCPs on HBV transmission, progress, and vaccination

Question type	Questions	Frequency, yes (%)
Questions related to HBV transmission and prognosis	Can you get HBV infection through percutaneous injury?	195 (65.7)
	Can you get HBV infection through mucous membrane contact with blood?	223 (75.1)
	Is blood infectious body fluid?	276 (92.9)
	Is vaginal fluid infectious body fluid?	263 (88.5)
	Is amniotic fluid infectious body fluid?	262 (88.2)
	Is urine infectious body fluid?	225 (75.8)
	Is hepatitis curable disease?	92 (31.0)
	Does HBV cause liver cancer?	229 (77.1)
Questions related to HBV vaccination	How many doses of HBV vaccine required for complete protection?	
	1 dose	3 (1.01)
	2 doses	12 (4.04)
	3 doses	233 (78.5)
	6 doses	2 (0.67)
	I do not know	47 (15.82)
	What is the expected interval between the first dose and the next dose?	
	1 month	174 (58.58)
	2 months	15 (5.05)
	3 months	35 (11.78)
	6 months	17 (5.72)
	I do not know	56 (18.8)
	What is expected interval between the last dose and the dose preceding?	
	1 month	34 (11.44)
	2 months	16 (5.38)
	3 months	35 (11.78)
	6 months	130 (43.77)
	I do not know	82 (27.60)
	If the vaccine is taken after exposure does it reduce the likelihood of being positive for HBV?	101 (34)
	Should immunity status be checked (anti HBsAg serologic testing be done) after completing the vaccine series?	149 (50.2)
If the immunity test result is negative does the vaccine series need to be repeated?	130 (43.7)	

Abbreviations: HBV, hepatitis B virus; HBsAg, hepatitis B surface antigen; HCPs, health care professionals.

Discussion

Hepatitis B virus (HBV) infection remains a significant global health challenge, with its presence observed worldwide (1, 2). The highest prevalence is reported in certain regions of Africa and Asia (17). Research conducted among various population groups in Ethiopia has also indicated that HBV poses a major public health concern (7, 17–19). Numerous studies highlight that healthcare professionals (HCPs) face a higher risk of contracting HBV compared to the general public (4, 6, 20, 21). For instance, an estimated 6,200 HBV cases occur annually among HCPs in parts of Africa (9, 22). Enhanced knowledge about HBV transmission and vaccination, combined with comprehensive immunization, could help reduce infection rates (2). This research aimed to evaluate HCPs' understanding and attitudes toward HBV infection and vaccination.

Approximately 73.1% of participants demonstrated adequate knowledge of HBV transmission, disease progression, and vaccination. Similar studies conducted in other regions have shown varying levels of awareness. For example, research from Kuwait found a generally high level of knowledge about HBV (23). Conversely, a study in Bahir Dar

reported that just over half of respondents (52%) were knowledgeable about HBV, while 62% were familiar with the vaccine (1). In contrast, a survey among the Turkish population residing in the Netherlands revealed low levels of awareness about HBV, which may be due to limited access to health-related information compared to HCPs (24).

A significant portion of participants (92.9%) knew that HBV could be transmitted through infected blood, and 88% recognized that bodily fluids such as vaginal and amniotic fluids are also transmission mediums. This finding aligns with research conducted in countries like Sudan and Morocco, where HCPs exhibited high levels of awareness about blood as a transmission route (25, 26). Similarly, in Nigeria, HCPs demonstrated good knowledge of HBV risk factors, with over 80% identifying percutaneous injuries, mucosal contact with blood, and skin abrasions as possible transmission routes (27). Other studies in Sudan and Ethiopia have also reported strong awareness among HCPs regarding occupational HBV risks (Gashu, unpublished data, 2015).

The majority of participants (94.6%) strongly agreed or agreed that HBV is a critical public health issue. Additionally, 91.3% believed their occupation placed them at greater risk of infection, and 94% considered vaccination essential. Findings from Kuwait support this, with 80.5% of respondents acknowledging occupational risks and 86.3% recognizing the importance of vaccination (23). In another study, 64.7% of respondents perceived their risk of acquiring HBV as high or very high (1).

Nearly half (49.2%) of participants reported exposure to conditions that increase the risk of HBV infection, with being overwhelmed at work (47.3%) and working under pressure (45.2%) frequently cited as contributing factors. This is consistent with findings from other studies, which identified being busy as a primary factor for exposure. The most common response after exposure was washing with soap, water, and antiseptic (48.6%). However, immediate reporting of incidents—a measure recommended by the Centers for Disease Control and Prevention—was practiced by only 7.3% of respondents.

In terms of vaccination, 77.7% of participants correctly identified the number of doses required for complete protection. This is comparable to findings from other studies, such as one reporting that 75.2% of participants correctly identified the vaccination regimen (Gashu, unpublished data, 2015).

The analysis revealed that the type of profession was the only significant factor influencing knowledge about HBV and its vaccination. This aligns with findings from other research, which also indicated a strong association between professional role and HBV knowledge levels. Conversely, some studies found no significant relationship between sociodemographic variables and knowledge about HBV (9).

Given that half of HCPs acknowledged exposure to risky situations, hospital administrators and policymakers should prioritize enhancing prevention strategies. Expanding access to protective measures and implementing sustainable infection control practices are essential. Providing training on the safe handling and disposal of infectious materials can further reduce occupational risks. Additionally, awareness campaigns to disseminate critical information about HBV transmission and vaccination are necessary, as the current level of knowledge (73.1%) remains inadequate.

Conclusion

HCPs demonstrated good overall knowledge about HBV transmission, progression, and vaccination. Most participants recognized the occupational risks associated with HBV and stressed the importance of vaccination. However, common reasons for exposure included work overload and rushing, highlighting the need for targeted interventions. Differences in knowledge levels were significantly associated with professional roles, underscoring the importance of tailored training and awareness programs for different healthcare roles.

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