

Studying the Knowledge, Attitude, and Practice of HealthCare Workers

Towards Hepatitis B Virus Prevention in Hospitals, Hodeidah City, Yemen, 2024

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Abstract: Background: Hepatitis B virus (HBV) infection is a public health problem. Healthcare workers (HCWs) are at a high risk for blood-borne pathogens due to their contact with patients and contaminated instruments. Vaccination of HCWs against HBV is standard practice in many countries but is often not implemented in resource-poor settings. To determine HBV knowledge attitude and practice, a study conducted in Al-Mukalla City a majority of participants had poor knowledge and practice about hepatitis B and its management. Also, the vast majority had a negative attitude toward hepatitis B virus.

Objective: The purpose of this study was to evaluate the knowledge, attitude, and practice (KAP) of HCWs towards hepatitis B infection in Hospitals, Hodeidah city. **Methodology:** We enrolled 290 HCWs from the main public and private hospitals (Athwrah and Almal Hospitals). Their demographics, medical histories, HBV vaccination details and risk factors for contracting blood-borne infections were collected using a standardized questionnaire. The study was conducted during the period of 1st of March to 1st of May 2024. **Results:** The overall KAP scores of HCWs were found to be 20%, 99.7%, and 30%, were positive respectively. Most of the participants correctly recognized the HBV infection. Among the participants, only 15% had undergone screening for HBV, and 43.8% had received HBV vaccine. Moreover, only 43% had completed the three doses of vaccination for HBV. Among the HCWs, the group with higher education level had better knowledge than the group with lower education level. However, the attitude of most of the participants towards HBV prevention was found to be adequate (99.7%). **Conclusion:** This study shows that HCWs in Hodeidah, Yemen is at high risk of HBV infection due to low vaccination coverage and inadequate infection control. Therefore, we strongly encourage providing an accessible and compulsory vaccination program for all HCWs to improve their attitude and awareness towards HBV infection and to achieve effective infection control.

Keywords: HBV, HBc, Health workers, Hodeidah, Yemen.

دراسة معرفة واتجاهات وممارسات العاملين في مجال الرعاية الصحية تجاه الوقاية

من فيروس التهاب الكبد الوبائي ب في المستشفيات، مدينة الحديدة، اليمن، 2024

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المستخلص: المقدمة: عدوى فيروس التهاب الكبد (HBV) هي مشكلة صحية عامة. يتعرض العاملون في مجال الرعاية الصحية لخطر كبير للإصابة بمسببات الأمراض المنقولة بالدم بسبب اتصالهم بالمرضى والأدوات الملوثة. يعد تطعيم العاملين في مجال الرعاية الصحية ضد فيروس التهاب الكبد B ممارسة معتادة في العديد من البلدان، ولكنه لا يتم تنفيذه في كثير من الأحيان في البيئات ضعيفة الموارد. لتحديد الموقف والممارسة المعرفية بشأن فيروس التهاب الكبد B، وبحسب دراسة أقيمت في مدينة المكلا غالبية المشاركين في تلك الدراسة اظهروا ضعف في المعرفة والممارسة عن فيروس الكبد B وعلاجه كما أن الأغلبية العظمى منهم كان لديهم سلوك سلبي تجاه الفيروس. أهداف الدراسة: سيكون الغرض من هذه الدراسة هو تقييم المعرفة والسلوك والممارسة (KAP) للعاملين في مجال الرعاية الصحية تجاه عدوى التهاب الكبد B في مدينة الحديدة. المنهجية: قمنا بتسجيل 290 عاملاً في مجال الرعاية الصحية من المستشفيات العامة والخاصة الرئيسية. تم جمع التركيبة السكانية الخاصة بهم وتاريخهم الطبي وتفاصيل التطعيم ضد فيروس التهاب الكبد B وعوامل الخطر للإصابة بالعدوى المنقولة بالدم باستخدام استبانة موحدة. أجريت الدراسة خلال الفترة من 1 مارس إلى 1 مايو 2024

النتائج: تم العثور على أن الدرجات الإجمالية لـ KAP للعاملين في مجال الرعاية الصحية هي 80%، و90.7%، و30%، على التوالي. تعرف معظم المشاركين بشكل صحيح على الإصابة بفيروس التهاب الكبد الوبائي. من بين المشاركين، فقط 15% منهم خضعوا لفحص فيروس التهاب الكبد B، و43.8% تلقوا لقاح التهاب الكبد B. علاوة على ذلك، لم يكمل سوى 43% جرعات التطعيم ضد فيروس التهاب الكبد B. من بين العاملين في مجال الرعاية الصحية، كانت المجموعة ذات مستوى التعليم العالي لديها معرفة أفضل من المجموعة ذات مستوى التعليم المنخفض. ومع ذلك، وجد أن موقف معظم المشاركين تجاه الوقاية من فيروس التهاب الكبد B كافٍ (99.7%). الاستنتاج: تظهر هذه الدراسة أن العاملين في مجال الرعاية الصحية في الحديدة، اليمن معرضون لخطر كبير للإصابة بفيروس التهاب الكبد الوبائي بسبب انخفاض تغطية التطعيم وعدم كفاية مكافحة العدوى. ولذلك، فإننا نشجع بقوة على توفير برنامج تطعيم إلزامي وإلزامي لجميع العاملين في مجال الرعاية الصحية لتحسين مواقفهم وتوعيتهم تجاه عدوى فيروس التهاب الكبد B وتحقيق مكافحة فعالة للعدوى.

الكلمات المفتاحية: التهاب الكبد الوبائي، التهاب الكبد الوبائي، العاملون الصحيون، الحديدة، اليمن.

1- Introduction:

Background: Hepatitis B (HB)virus is a member of Hepadnaviral family. It is a DNA virus surrounded by an envelope which contains HBsAg surface antigen which is important for immunization and laboratory diagnosis. In addition to HBsAg, there are 2 other important antigens: Core antigen (HBcAg) and e antigen (HBeAg) ^[1]. Hepatitis B infection is one of the major public health problems globally and is the tenth leading cause of death ^[2]. Worldwide, more than two billion people are infected with hepatitis B virus (HBV) of these, 240 million are chronic carriers of HBV and are at risk of death from acute fulminant liver disease, hepatocellular carcinoma (HCC) or liver cirrhosis ^[3].

with hepatitis B virus is global public health problems which affect over 350 and 170 million people worldwide respectively, reaching endemic proportions in sub-Saharan Africa ^[4,5]. In Southeast Asian Region, there are estimated 80 million hepatitis B virus carriers (about 6% of the total population) ^[6]. In India, the prevalence of hepatitis B infection among the general population ranges from 2 - 8%, which places India in an intermediate endemicity zone and India with 40 million cases ^[7].

Hepatitis B is recognized as occupational risks, for Health Care Workers ^[8]. Health Care Workers (HCW) are defined as people (e.g. employees, students, contractors, attending clinicians, public safety workers, or volunteers) whose activities involve contact with patients and with blood or body fluids from patients in health care, laboratories or public safety setting ^[5]. Throughout the world, millions of healthcare professionals work in Health Institutions and as such, an estimated 600,000 - 800,000 cuts and puncture injuries occur among health care providers per year, many of which (approximately 50%) are not registered ^[5,9].

HBV is spread through contact with infected body fluids and the only natural host is human. Blood is the most important vehicle to transmission, but other body fluids have also been implicated, including semen and saliva ^[10].

Hepatitis B infections are common due to lapse in the sterilization technique of instruments or due to the improper hospital waste management as 10 - 20% health care waste is regarded hazardous and it may create variety of health risk. Among the health care personnel's HBV is transmitted by prick of infected, syringes and contaminated needles in the skin or through accidental inoculation of the minute quantities of blood during surgical and dental procedure ^[11].

The incubation period of HBV infection averages 60 days, with a range of 45 to 160 days. HBV can remain infectious at ambient temperatures in the environment for one week or longer ^[12]. Infection with HBV may result in acute or chronic disease, both of which can be asymptomatic. If symptoms are present, onset of acute disease is usually insidious, with loss of appetite, nausea, vomiting, vague abdominal discomfort and sometimes arthralgia and rash, often progressing to jaundice. Fever may be absent or low-grade. Liver enzyme levels are markedly elevated. The severity of the disease ranges from unapparent cases (detectable only by liver function tests) to fulminant, fatal disease ^[1].

Hepatitis B virus (HBV) is the greatest threat of infection for health care workers (HCW). The risk of contracting hepatitis B by health care personnel is 4 times greater than that of the general adult population, among those who do not work in healthcare institutions ^[13]. Even though there are infection control practices and administration of hepatitis B immune globulin following suspected exposure to decrease the risk of HBV transmission, none have been as effective as active immunization with hepatitis B vaccine, which remains the single most important hepatitis B prevention measure ^[14,15]. In Yemen some studies like this study found that participants had poor knowledge, attitude and practice toward hepatitis B and C. In Hadhramaut University students ^[16].

AL-Hodeida city is located on a flat coastal plain, on a flat and narrow coastal plain between the foothills of the highlands and the Red Sea. Hodeida is the fourth largest governorate in Yemen. Hodeida city is a tropical region with a population of 2,687,674 and an area of 17,509 km². It contains 26 districts, three of them in the urban (Al- Hali, Al-Hawk and Al-Meena districts), the remaining districts are in the rural areas. These hospitals in Hodeida are considered as the only reference hospitals to population of the governorate and its neighboring governorate like Al- Mahweet, Raima, Hajja and some districts Dhamar. Hospitals provide services in different departments like gynecology, pediatrics, dentistry, ophthalmology, dermatology, surgery, pharmacy, medical laboratory, blood bank center, infectious diseases and others. It has about 400 beds in both hospitals. These hospitals provide their services around the clock for about 2000 patients daily in all different centers in the hospitals. ^[17]

Study Significance: The significance of this study lies in its potential to address a critical public health concern represented in Hepatitis B Virus (HBV) transmission in healthcare settings ^[18]. Healthcare workers (HCWs) are at a heightened risk of contracting and transmitting HBV due to their frequent exposure to blood and body fluids, which is a major route of infection ^[19]. In countries like

Yemen, where healthcare systems are already strained due to ongoing conflict and resource limitations, the risk of HBV transmission is exacerbated by limited access to vaccines, insufficient infection control practices, and a lack of awareness^[20]

Study Justification: Hepatitis B Virus (HBV) is a major public health issue worldwide, particularly in healthcare settings where occupational exposure to blood and body fluids increases the risk of infection^[17]. In Yemen, HBV is a significant burden, with limited resources and awareness compounding the issue, especially in conflict-affected regions like Hodeidah City.

Assessing the KAP of HCWs in Hodeidah hospitals is critical for identifying gaps in knowledge and behavior that could lead to the spread of HBV within healthcare settings. This study will provide valuable insights into current prevention practices, inform future training programs. The findings will also be crucial for improving policy and strengthening infection control measures in Yemeni hospitals, contributing to better protection for HCWs and the communities they serve^[20].

Aims of the study

General objective:

The purpose of this study was to evaluate the knowledge, attitude, and practice (KAP) of HCWs towards hepatitis B infection in Hospitals, Hodeidah city.

Specific objectives:

- To assess the knowledge about hepatitis B and universal precautions practices of health care workers in Hospitals of Hodeida city
- To determine the attitude of HCWs towards hepatitis B infection
- To identify the practices of HCWs towards hepatitis B prevention
- To identify Association between knowledge, attitude, practice and socio- demographic factors of HCWs.

2- Methodology:

Study design:

The study was conducted this study based cross-sectional study in Hodeidah city.

■ Study area:

The study was conducted at Al-Thawra Public Hospital and Al-Amal Hospital in Al-Hodeida city.

■ Study Population:

Healthcare Workers who were in direct contact with the patients or equipment used on patients are more likely to get exposure to blood-borne pathogens. So, all HCWs working in the departments that were deemed to be high-risk units including dentistry, maternity and delivery, emergency, laboratory, and surgical units in the selected hospitals at Hodeida and who met the inclusion criteria were in our study population.

■ Sample size:

The required sample size was calculated by using Open Epical software, Version 7.2.5, based on an expected prevalence (P) of 70%, at 95% level of confidence and the acceptable maximum error (5%) and the total number of HCWs was 2900 [63]. The minimum sample size was 290 health workers. Thereafter, the sample size was 290 HCWs.

Pilot study:

Before the main data collection, a pilot study was conducted to assess the reliability, clarity, and feasibility of the structured questionnaire. The pilot involved 20 healthcare workers from a hospital in Hodeidah City, who were not part of the main study sample, to ensure that the questionnaire was suitable for the target population. The participants provided feedback on the clarity of the questions, the ease of completing the questionnaire, and the time required to finish it. Based on their feedback, minor adjustments were made to the wording of some questions to improve understanding and ensure the tool's validity in the local context. The pilot study also allowed the research team to test the logistics of distributing and collecting the questionnaires, ensuring a smooth process during the full-scale study. The reliability of the knowledge, attitude, and practice sections was tested using Cronbach's alpha to ensure internal

consistency. This preliminary phase was essential in refining the data collection instrument and ensuring the reliability and validity of the final study.

Data collection:

The sample size was 290 health workers. The study utilized a 26-item structured questionnaire to collect data from healthcare workers, covering several key areas: demographics, knowledge, attitude, practice, and sterilization practices. The questionnaire, adapted from a pre-validated and pre-designed tool, was designed to assess participants' understanding of Hepatitis B Virus (HBV) prevention. The knowledge section included questions aimed at evaluating basic knowledge of HBV, including its etiology, natural history, modes of transmission, complications, and post-exposure prophylaxis (PEP). The responses to the knowledge questions were categorized as either "correct" or "incorrect" to ensure objective assessment. The attitude section sought to determine whether respondents had a favorable outlook on HBV prevention by gauging their beliefs on the importance of sterilization, wearing gloves, and vaccination to prevent transmission, as well as their willingness to recommend PEP for those exposed to HBV.

In the practice section, respondents were asked about their actions related to HBV prevention, with a specific focus on their use of personal protective equipment and sterilization techniques. If a respondent reported no history of needle stick injury, they were instructed to answer only three of the practice questions, leaving the remaining questions unanswered. This design was intended to capture relevant data while excluding questions not applicable to the participant's experience. Overall, the questionnaire aimed to provide a comprehensive understanding of healthcare workers' knowledge, attitudes, and practices related to HBV prevention, offering valuable insights into gaps and opportunities for improvement in infection control measures.

Inclusion Criteria:

- Healthcare workers (doctors, nurses, laboratory technicians, and other patient care staff) are employed at hospitals in Hodeidah City, Yemen.
- Minimum of six months of work experience in the healthcare setting.
- Direct involvement in patient care.
- The willingness to provide informed consent for participation.

Exclusion Criteria:

- Healthcare workers with less than six months of work experience.
- Non-clinical staff (e.g., administrative personnel) are not directly involved in patient care.
- Healthcare workers are on leave during the study period.
- Individuals who declined to participate or withdrew consent at any stage of the study.

Statistical analysis:

The collected data was entered and analyzed using the statistical program (SPSS). Data was presented in tables and figures in the results chapter. The Statistical Package for Social Sciences (SPSS) software version 28 was utilized to analyze the data at hand. Descriptive statistics of SPSS provided frequency tables and the distribution of the variables. We also collected data by compute in SPSS and divided the data into poor and good, where more than 50% is good and less than 50% is poor.

Ethical consideration:

1. Permission was taken from the Faculty of Medicine and Surgery, department of Community Medicine, and the scientific research committee.
2. Permission was taken from the hospital's directors and the participants in the research who worked in the hospitals.
3. Adequate level of confidentiality of the research data was ensured. Informed consent and voluntary participation of respondents were done.

3- Results

Socio-demographic characteristics of the study participants

Table 1: Socio-demographic characteristics of the study participants, Hodeidah City, 2024 (n=290)

socio- demographic variables		Number	Percentage
Gender	Male	138	47.6
	Female	152	52.4
Age	<20	1	0.3
	20-29	149	51.4
	30-39	111	38.3
	> 40	29	10.0
Education level	Experience	43	15
	Diploma	174	60
	Bachelor's degree	67	23
	Master's and above	6	2
Hospital	public hospital	185	63.8
	private Hospital	105	36.2
Occupation	Physician	14	4.8
	Dentists	7	2.4
	Physician Assistant	75	25.9
	Nurse	121	41.7
	Midwife	19	6.6
	Technician	18	6.2
	Laboratory	19	6.6
	Others	17	5.9
Experience years	< 1 years	23	8
	years1-2	56	19
	years3-5	99	34
	> 5 years	112	39

The socio-demographic data of the 290 study participants from Hodeidah City in 2024 highlight a diverse composition of healthcare professionals. In the table (1) show that gender more than half (52.4%) of sample were females. half (51.4%) of participants is in the 20-29 age group, followed by more than one third (38.3%) in the 30-39 age group.

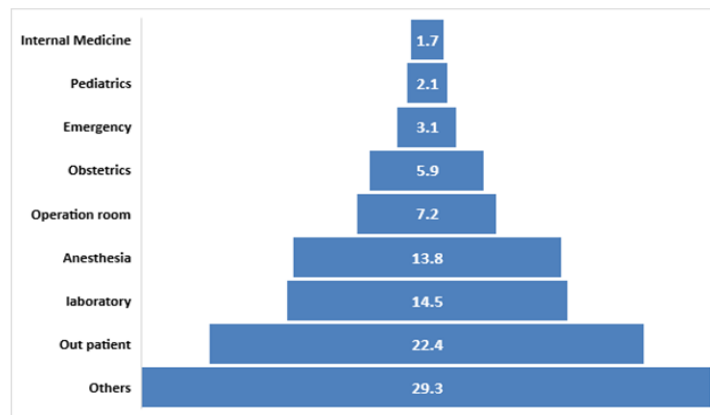
Regarding education level, less than two third (60%) of participants hold a diploma, while less than one quarter (23%) have a bachelor's degree.

The data also show that tow third (63.8%) of participants are employed in public hospitals, while one third (36.2%) work in private hospitals.

According to the occupation of the participants the more than two fifth (41.7%) were nurses, followed by medical assistants, approximately one quarter (25.9%). The remaining participants include physicians (4.8%), midwives (6.6%), laboratory technicians (6.6%), and other healthcare professionals (8.5%).

In terms of years of experience, more than two (39%) of participants have over 5 years of experience.

Figure (1): Distribution participants according to department



This figure (1): show that less than one quarter (22.4%) were working in the outpatient department, and less than one fifth (14.5%) in the laboratory.

2. Knowledge about HBV infection

Table 2: Knowledge about HBV infection of the study participants, Hodeidah City, 2024 (n=290)

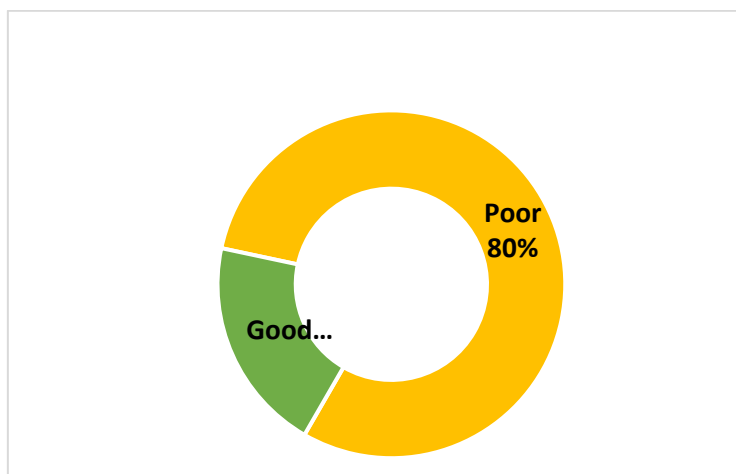
Statements	Correct Response	
	Frequency	Percentage
There are several types of hepatitis	278	96
Hepatitis B is a viral infection	282	97.2
The virus can cause acute hepatitis	119	41
The virus can cause chronic hepatitis	204	70.3
The virus can cause liver cirrhosis	164	56.6
The virus can cause hepatocellular carcinoma	77	26.6
The infection can cause death	66	22.8
Knowledge about Transmission routes		
Hepatitis B can be transmitted through blood transfusion	242	83.4
The virus can be transmitted by sexual intercourse	130	44.8
transmitted through from mother to her child at birth	132	45.5
HBV can be transmitted by any body fluids	116	40.0
Through a needle stick injury	230	79.3
Knowledge about Prevention measures		
Post-exposure prophylaxis includes IG & vaccination	195	67.2

In this table (2): show that demonstrated a strong general knowledge about Hepatitis B virus (HBV), with most the participants (96%) aware that there are several types of hepatitis, and (97.2%) recognizing that HBV is a viral infection. However, less than half of participants (41%) knew it could cause acute hepatitis, and (70.3%) were aware of its link to chronic hepatitis. Knowledge about more severe consequences, such as liver cirrhosis (56.6%), hepatocellular carcinoma (26.6%), and death (22.8%), was considerably lower, indicating the need for better education about HBV's long-term effects.

Regarding transmission routes, participants were well-informed about blood transfusion (83.4%) and needle stick injuries (79.3%) as common transmission modes. However, awareness of sexual transmission (44.8%), mother-to-child transmission (45.5%),

and the role of body fluids (40%) in spreading HBV was moderate to low. Knowledge of prevention measures was also moderate, with (67.2%) aware that post-exposure prophylaxis includes immunoglobulin (IG) and vaccination.

3. Overall KAP scores



in this figure (2): show the overall knowledge of HCWs was the most (80%) of participant were poor knowledge, while only 20% had a good knowledge score.

Figure (2): Total score of study participants knowledge regarding HBV of the study population

Table 3: Association between socio-demographic characteristics and knowledge of HCWs in hospitals in Hodeidah

socio-demographic variables		Knowledge Category n*		(Pvalue)
		Poor	Good	
Gender	Male	107	31	0.251
	Female	126	26	
Age	<20	1	0	0.937
	20-29	121	28	
	30-39	88	23	
	> 40	23	6	
Education level	Experience	36	7	0.790
	Diploma	139	35	
	Bachelor degree	54	13	
	Master's and above	4	2	
Hospital	public hospital	148	37	0.844
	private Hospital	85	20	
Occupation	Physician	9	5	0.098
	Dentists	7	0	
	Physician Assistant	60	15	
	Nurse	99	22	
	Midwife	18	1	
	Technetion	16	2	
	laboratory	12	7	
Others	12	5		
Department	Internal Medicine	32	8	
	Pediatrics	13	4	

socio-demographic variables		Knowledge Category n *		(Pvalue)
		Poor	Good	
	Emergency	53	12	0.897
	Obstetrics	35	7	
	Operation room	4	1	
	Anesthesia	6	0	
	laboratory	15	6	
	Out patient	8	1	
	Others	67	18	
Experience years	< 1 years	18	5	0.671
	years1-2	47	9	
	years3-5	76	23	
	> 5 years	92	20	

There was no a significant association between knowledge score and socio-demographic variables ($P > 0.05$).

Table 4: Association between socio-demographic characteristics and practices of respondents in Hodeidah

socio- demographic variables		Practice Category n *		(Pvalue)
		Poor	Good	
Gender	Male	99	39	0.462
	Female	103	49	
Age	<20	1	0	0.653
	20-29	107	42	
	30-39	76	35	
	> 40	18	11	
Education level	Experience	33	10	0.001*
	Diploma	136	38	
	Bachelor degree	31	36	
	Master's and above	2	4	
Hospital	public hospital	146	39	0.001*
	private Hospital	56	49	
Occupation	Physician	10	4	0.119
	Dentists	6	1	
	Physician Assistant	61	14	
	Nurse	79	42	
	Midwife	14	5	
	Technician	9	9	
	laboratory	11	8	
Department	Others	12	5	0.311
	Internal Medicine	34	6	
	Pediatrics	14	3	
	Emergency	44	21	
	Obstetrics	28	14	
	Operation room	3	2	
	Anesthesia	4	2	
laboratory	11	10		

socio- demographic variables		Practice Category n *		(Pvalue)
		Poor	Good	
	Out patient	6	3	
	Others	58	27	
Experience years	< 1 years	15	8	0.462
	years1-2	40	16	
	years3-5	74	25	
	> 5 years	73	39	

The findings showed that practices had a significant association with the education level ($p < 0.001$) and type of hospital ($p < 0.001$) of the participants'. Other variables are not associated with practices

Table 5: Association between socio-demographic characteristics and attitude of respondents in Hodeidah City, Yemen

socio- demographic variables		Attitude Category n *		(Pvalue)
		Negative	Positive	
Gender	Male	1	137	0.293
	Female	0	152	
Age	<20	0	1	0.655
	20-29	0	149	
	30-39	1	110	
	> 40	0	29	
Education level	Experience	1	42	0.124
	Diploma	0	174	
	Bachelor degree	0	67	
	Master's and above	0	6	
Hospital	public hospital	1	184	0.450
	private Hospital	0	105	
Occupation	Physician	0	14	0.986
	Dentists	0	7	
	Physician Assistant	0	75	
	Nurse	1	120	
	Midwife	0	19	
	Technicians	0	18	
	laboratory	0	19	
	Others	0	17	
Department	Internal Medicine	1	39	0.617
	Pediatrics	0	17	
	Emergency	0	65	
	Obstetrics	0	42	
	Operation room	0	5	
	Anesthesia	0	6	
	laboratory	0	21	
	Out patient	0	9	
	Others	0	85	
Experience years	< 1 years	0	23	
	years1-2	0	56	

socio- demographic variables	Attitude Category n *		(Pvalue)
	Negative	Positive	
years3-5	0	99	0.661
> 5 years	1	111	

*Significant as $P < 0.05$.

Table 5: show there was no a significant association between Attitude score and socio-demographic variables ($P > 0.05$)

Discussion

Hepatitis B virus (HBV) is the virus that causes hepatitis B, an infectious illness, and is a serious global public health problem [21]. Thus, raising awareness is essential to any plan for managing and preventing infectious diseases [22]. This study aims to assess the knowledge, attitudes, and practices (KAP) of HBV among HCPs in selected public hospitals in Hodeidah City, Yemen .

This study shows that 20% of participants HCWs have a good level of knowledge about HBV, which is lower than what was reported by Roien; 2021 in Afghanistan, which showed that HCWs have good knowledge about HBV (86.58%) [23]. Similarly, Iqbal M. et al. 2023 in Pakistan show that 58.2% of participants had an average level of HBV knowledge [24].

The findings of a previous study study posited that they did not find a significant association between the level of knowledge and socio-demographic variables (age, occupation, marital status, educational level, or working experience in this study.) ($p > 0.05$). This finding is in line with study in Pakistan [24] and in Sudan [25]. on the contrary study conducted among HCWs in White Nile state in Sudan showed that the level of knowledge was significantly associated with occupation and educational degree [26].

In our study overall attitude score was positive (99.7%) participants had positive attitudes towards the preventive measures of HBV infection and its vaccination. This result was higher compared to another study in Sudan in which many of the respondents (86.4%) displayed a favorable attitude towards the preventive measures of HBV infection [25].

Conclusion

Based on the results of the data analysis, several conclusions can be drawn. The findings reveal that healthcare workers (HCWs) have poor knowledge and practice scores regarding HBV infection, though most exhibit a positive attitude towards the issue. A significant portion of HCWs lack sufficient knowledge about post-exposure prophylaxis (PEP) and prevention of occupational exposure. The study also highlights a low rate of HBV vaccination coverage, coupled with a moderate incidence of needle stick injuries (NSI). Furthermore, practice scores were significantly associated with education level and hospital type, whereas no statistically significant association was found between knowledge and attitude scores and socio-demographic variables. The most common reasons for HCWs not being vaccinated were vaccine unavailability, cost, and fear of side effects. The study limitation: the study was conducted in hospitals within Hodeidah City, which may limit the generalizability of findings to other regions in Yemen or beyond

Recommendations

According to our key findings, we would like to forward the following recommendations:

- 1- Health care workers must be properly trained in the use of personal protective equipment (PPEs), safe handling techniques, and correct disposal of potentially infected materials and equipment would be important to reduce occupational HB transmission .
- 2- Perform awareness creation activities like disseminating important information on HBV infection and its vaccination are done, especially in areas where HCPs had knowledge and practices deficiencies.
- 3- There was a significant number of healthcare personnel were not vaccinated; this indicates the need for well-planned and clear policies of HBV vaccination to maintain a steady supply HB vaccine.
- 4- Further research should be carried out in other levels of health care settings.

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