

Knowledge, Attitudes, and Practices of Dental Healthcare Workers toward Hepatitis B Virus in Khartoum/Sudan

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ABSTRACT

Objective: The aim of the present study is to evaluate dental healthcare workers' knowledge, attitudes, and practices toward hepatitis B infection.

Materials and methods: This study was a cross-sectional self-administered, structured questionnaire survey that was conducted in Khartoum/Sudan. The questionnaire was completed by 177 dental healthcare providers who practice in public dental clinics in Khartoum state. The completion rate was 100%.

Results: The study participants showed relatively acceptable knowledge of hepatitis B virus (HBV) infection. The majority (98.3%) were familiar with hepatitis B infection. About 93% answered correctly that blood, blood products, and needles/sharps are the route of transmission of HBV. About 65.5% completed HBV vaccination. About 59.3% had a history of needle sticks and only 16% reported their injury. Dentists and nurses almost had the same knowledge, but dentists were slightly having better knowledge in some aspects. Statistical Package for Social Sciences (SPSS) version 20 was used. Chi-square test was used to determine the relationship between categorical variables.

Conclusion: Most of the study participants were aware of HBV infection, routes of transmission, prevention, and necessity of vaccination, but they are deficient in some areas, like needle-stick injury protocol and post-exposure prophylaxis (PEP). The study revealed a low level of HBV vaccination coverage rate. Further strategies for preventing workplace exposure, training programs on HBV infection, including PEP, and increasing the vaccination coverage rate of all healthcare workers are highly recommended.

Clinical significance: Dental healthcare workers are at high risk of acquiring hepatitis B infection. The majority of exposure in dentistry is preventable. Understanding the knowledge and awareness of dental health toward hepatitis B is crucial to design and apply preventive measures to control transmission and potential complications.

Keywords: Attitude, Healthcare workers, Hepatitis B, Knowledge, Needle-stick.

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INTRODUCTION

Hepatitis B virus infection is one of the greatest global public health issues. Over 350 million people around the world are chronic HBV carriers, who are at a high risk of developing serious problems like acute and chronic active hepatitis, cirrhosis, and hepatocellular carcinoma. Since the majority of infections are subclinical, 80% of all hepatitis infections go undetected, therefore, patients' medical history is unreliable in determining if they are hepatitis B virus infected.¹ Sudan is classified among the countries with high hepatitis B virus endemicity.¹

Dental healthcare workers are susceptible to contracting HBV from needle-stick injuries or contact with bodily fluids like blood or other bodily fluids.² Higher prevalence of HBV infection among dentists, especially dental surgeons, has been reported in serological studies from different parts of the world in comparison with the general population.³⁻⁵ Dentists can play a significant role in the prevention of hepatitis by treating every patient as a possible hepatitis carrier. To lessen the danger of contracting hepatitis, effective infection control, sterilization, and preventive immunization practices should be put into place.⁶ Prevention of hepatitis B transmission through the medical care setting is an important public health issue.⁷ Following proper vaccination protocols as a prophylaxis along with proper sterilization and sanitation can prevent maximum proliferation of hepatitis B cases.

The majority of exposure in dentistry is preventable. Standard precautions that reduce the risk of blood contact include use

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of protective personal equipment,⁸ utilizing equipment with characteristics designed to avoid sharp injuries, and changing work procedures. Dental practices and laboratories should establish written, comprehensive programs that include hepatitis B vaccination and post-exposure management protocols.^{9,10}

Sudan is one of the countries with high seroprevalence of HBV. Hepatitis B virus infection is highly prevalent among dentists.¹ The aim of our study was to evaluate dental healthcare workers' knowledge, attitudes, and practices toward HBV. Findings of such study will be beneficial to design and apply preventive measures to control transmission and potential complications.

MATERIALS AND METHODS

The study design was a descriptive cross-sectional study using a self-administered, structured, and prevalidated questionnaire that was conducted in the period from January to December 2017.

The questionnaire was designed by a team of dental professionals after a thorough literature review to insure its validity. The questionnaire was an updated form of the questionnaire designed by Habiba et al.¹¹ The questionnaire was prepared in both Arabic and English language. The questionnaire was designed to be comprehensible and was pretested on a group of 10 doctors who were requested to complete the questionnaire. The questionnaire was designed to suit the study aims and objectives, be clearly understood and interpreted to minimize respondents' errors, allow honest replies from respondents, and interpret data efficiently. The questionnaire was designed to give overall view of participants' demographic data (age, gender, marital status, years of experience, and position) and knowledge, attitude, and practices regarding hepatitis B infection. Questionnaires were distributed to participants to be filled on the spot. The confidentiality and anonymity of the respondents were assured.

The participation in this study was entirely voluntary and the participants were allowed to withdraw from the study at any time they wished to do. The purpose of the study and all the terms used in the study was explained to the respondents.

The participants were the dental healthcare providers working in dental public clinics in the seven geopolitically defined Khartoum State cities. A total of 177 questionnaires were distributed (123 dentists and 54 dental nurses). Exclusion criterion was postgraduate dentists who were not actively working in clinical dental practice at the time of the study. All the distributed questionnaires were complete, with no drop-off or excluded ones (completion rate 100%).

The questionnaire was of 29 questions: 5 items for demographic data, 18 questions to evaluate participants' knowledge, and 6 items to evaluate their attitude and practices toward hepatitis B infection. All the questionnaire items were close-ended questions. Questions in Table 1 concerning modes of HBV transmission and preventive measures, the responses were presented as yes or no, and the number and percent of each answer were calculated. Data were gathered, categorized, and coded, then, it was entered

Table 1: Comparison between dentists and nurses regarding knowledge toward hepatitis B modes of infection transmission, preventive measures, and hepatitis B vaccine

Variable	Dentists responded by Yes		Nurses responded by Yes		Total responded by Yes		p-value
	Number	Percentage	Number	Percentage	Number	Percentage	
Modes of transmission of hepatitis B							
Blood-borne infection	118	95.9	48	88.9	166	93.8	0.074
Sharp objects	118	95.9	47	87	165	93.2	0.03*
Sexual intercourse	83	67.5	17	31.5	100	56.6	0.001*
Contaminated water	23	18.7	17	31.5	40	22.6	0.061
Feco-oral route	21	17.1	21	38.9	42	23.7	0.002*
Knowledge of preventive measures of HBV infection							
Vaccination	121	98.4	50	92.6	171	96.6	0.05
Wearing gloves	120	97.6	52	96.3	172	97.2	0.64
Avoidance of hepatitis B patients	16	13	18	33.3	34	19.2	0.002*
Wearing goggles	78	63.4	41	75.9	119	67.2	0.102
Multivitamins/Blood tonic	13	10.6	15	27.8	28	15.8	0.004*
Adequate disposal of sharps	113	91.9	44	81.8	157	88.7	0.044*
Antibiotics after contact	9	7.3	9	16.7	18	10.2	0.058
Avoid needle/Sharps injury	113	91.9	46	85.2	159	89.8	0.0175*
Avoid extramarital sex	79	64.2	18	33.3	97	54.8	0.001*
Avoid drinking contaminated water	20	16.3	20	37	40	22.6	0.002*
Avoid food not well-cooked	9	7.3	15	27.8	24	13.6	0.001*
Hepatitis B vaccine							
Number of doses							
1–2 doses	7	5.7	1	1.9	8	4.5	0.308
3 doses	101	82.1	49	90.7	150	84.7	
4–5 doses	15	12.2	4	7.4	19	10.7	
Interval between doses							
<4 weeks	8	6.5	2	3.7	10	5.5	0.536
4 weeks	79	64.2	39	72.2	118	66.7	
>4 weeks	36	29.3	13	24.1	49	27.7	

into the computer. Data were analyzed using Social Package of Statistical Analyses (SPSS/version 20). Descriptive statistics was used to describe the demographic factors. Chi-square test was used to determine correlation between the scale variables of the sample.

The study proposal was submitted and approved by the Ministry of Health Khartoum State/Sudan. Informed consents were signed by participants prior to the commencement of the study.

RESULTS

In our study, 177 participants responded to the questionnaire. Table 2 illustrates the participants’ demographic data. The range of age of participants was 20–60. They were divided into four age-groups: yet the majority of them were young (20–30 years). Most of the participants were females (female: male ratio was 2:1). About half of them were married. Most of the participants had an experience of less than 10 years. Dentists accounted for two-thirds of the participants. The percentage of specialists and registrars was the least.

Table 3 shows that most of the participants were aware of the high risk of getting hepatitis B infection by health workers. About 86.4% agreed that they could transmit hepatitis B infection to patients if they are infected. Most of them agreed that they need

to be protected, nevertheless, only 58.2% consider all patients as HBV infected.

Table 1 illustrates the awareness of mode of transmission of hepatitis B infection, means of prevention, and hepatitis B vaccine. It also shows the difference in awareness between the two categories of participants (dentists and nurses). The majority of participants were aware that hepatitis B is a blood-borne infection that could be transmitted by sharp objects (the percentages were 93.8% and 93.2%, respectively), yet awareness was significantly higher among dentists compared with nurses regarding sharp object transmission of hepatitis B infection (*p*-value = 0.03). About 56.6% of participants thought that hepatitis B could be transmitted by sexual intercourse yet awareness was better among dentists (*p*-value = 0.001). About 22.6% and 23.7% of the participants showed misconception for contaminated water and feco-oral routes to be modes of transmission of the disease. The misconception of the latter was significantly higher among nurses (*p*-value = 0.002).

Regarding awareness of participants’ preventive measures of hepatitis B, the majority of participants were aware of the effectiveness of vaccination, wearing gloves, proper disposal of sharp objects, and avoidance of needle/sharp injury in prevention of the disease (percentages were 96.6%, 97.2%, 88.7%, and 89.8%, respectively). On the other hand, only 54.8% thought that avoidance of extramarital sex is a preventive measure of

Table 2: Demographic data

Variable	Number	Percentage	Variable	Number	Percentage	
Age			Experience			
20–30	76	42.9	<10 years	109	61.6	
31–40	59	33.3	10–19 years	46	26	
41–50	30	16.9	20–29 years	17	9.6	
51–60	12	6.8	30 years or more	5	2.8	
Gender			Marital status			
Male	59	33.3	Married	100	56.5	
Female	118	66.7	Single	77	43.5	
Variable			Number	Percentage		
Position of participants						
Specialists			15	8.5		
Registrars			14	7.9		
General practitioners			94	53.1		
Nurses			54	30.5		

Table 3: Attitude of participants towards infectivity and risk of HBV

Variable	Number		Percentage	
	Yes	No	Yes	No
Participants’ job puts them at risk of hepatitis B infection	172	5	97.2	2.9
Health workers can infect patients with hepatitis B	153	24	86.4	13.6
Health workers need protection from hepatitis B infection	167	10	94.4	5.6
Health workers consider all patients as HBV infected	103	74	58.2	41.8



hepatitis B infection. About 67.2% of participants believed that wearing goggles could prevent from hepatitis B infection, on the other hand, 19.2%, 15.8%, 10.2%, 22.6%, and 13.6% thought that prevention of hepatitis should be through avoidance of hepatitis B patients, taking multivitamins, use of antibiotics, avoidance of contaminated water, and avoidance food not well cooked, respectively.

About 84.7% and 66.7% of the participants responded correctly to the question of number of vaccine doses and the interval between the doses with no significant difference between nurses and dentists.

Table 4 shows the attitude and practices of participants toward needle-stick injury; 59.6% of the respondents had a history of needle-stick injury, however, only 22.6% of them were aware of the needle-stick injury management protocol. Their ignorance of needle-stick injury protocol was reflected in their responses to needle-stick injury by disinfection, washing, or ignoring when only 16.4% responded by reporting the case.

Table 5 shows differences between dentists and nurses regarding practices of hepatitis B vaccination. About 86% of the study participants' received hepatitis B vaccine at least once,

however, only 65.5% of participants completed doses. Attitude among dentists was significantly better than nurses (p -value = 0.043). Nevertheless, the majority of the study participants did not respond for reasons of failing to take HBV infection vaccination.

DISCUSSION

This cross-sectional questionnaire-based study was constructed to assess knowledge awareness and attitude of dental health workers toward hepatitis B. Participants were questioned about the potential for a health worker to transmit the disease to their patients, the mechanism of HPV transmission, and some inaccurate modes of transmission were included.

All mentioned strategies were followed to ensure high reliability of the questionnaire and hence achieve the aim of the study. Most of our participants were dentists, females were as twice as males. They were young as 42.9% were under 30 years, and 61.6 had experience less than 10 years.

In the present study, participants' knowledge concerning the various aspects of HBV was generally high and consistent with current scientific evidences, since 93.8% of the respondents said that the method of transmission via blood and blood products and injury with contaminated needle and sharps. While in a similar study conducted by Samuel et al.¹² in Nigeria, it was only 86.5%, and the result was much higher when compared with a study in Pakistan in which it was only (40.5%) of those who believed that HBV is transmitted through contaminated needles.¹³ When considering incorrect routes of transmission, it seems that, higher proportion of our study participants had the misconception that HBV can be transmitted through feco-oral route and contaminated water (23.7% and 22.6%, respectively) when compared to Samuel et al. study; Nigerian healthcare providers had better knowledge (14.2% and 9.3%, respectively).¹² This might be due to the fact that the most common form of hepatitis in Sudan is hepatitis A that is transmitted by feco-oral route, and contaminated water and foods. In the present study, 56.5% of participants said that hepatitis B is sexually transmitted, which is similar result to the study held in India by Tirounilacandin et al.¹⁴ (52.2%) and greater than the study held in Nigeria by Samuel et al. (37%).¹²

Table 4: Attitude and practices toward needle-stick injury

Previous exposure to needle-stick injury	Percentage
Yes	59.3
No	40.7
Awareness of needle-stick injury protocol	Percentage
Yes	22.6
No	77.4
Response to needle-stick injury	Percentage
Report the case	16.4
Neglected it	8.5
Use disinfectant to manage it	31
Cover by prophylaxis	6.2
Wash it	35

Table 5: Practices of participants toward hepatitis B vaccination

Variable	Number	Percentage	
Received hepatitis B vaccine at least once	152	86	
Completion of hepatitis B vaccine			
<i>Dentists completed the doses</i>		<i>Nurses completed the doses</i>	
<i>Number</i>	<i>Percentage</i>	<i>Number</i>	<i>Percentage</i>
80	45	36	20.3
<i>Dentists did not complete the doses</i>		<i>Nurses did not complete the doses</i>	
31	17.5	5	2.8
Never vaccinated		25	14
<i>Causes of being unvaccinated</i>		<i>Number</i>	<i>Percentage</i>
No reason		17	9.6
I am very careful		2	1.1
No time/Too busy		6	9.6

Regarding awareness of prevention measures, the results of our study were good compared with other studies. Majority of participants (96.6%) had a favorable opinion and attitude toward HBV vaccination's importance for disease prevention compared with other studies conducted in Nigeria¹² and Kuwait¹¹ (77.2% and 81.5%, respectively).

Moreover, 89.8% mentioned the necessity of proper disposal of sharps, needles and blood as preventive measures of the disease. However, in spite of high level of knowledge of respondent in the present study regarding ways of prevention, their behavior practice results were unsatisfactory as only 67.2% are wearing goggles.

Regarding completion of HBV vaccination, only 86% of participants have received at least one dose of the vaccine, while 65.5% completed vaccine doses. The present study result was considered good compared with the results obtained by a similar study conducted in Sudan by Bakry et al. where more than 50% of healthcare providers were not vaccinated.¹⁵ This is a good indicator of the improvements of attitude of healthcare providers toward HBV vaccination. In contrast to this result, other studies showed a high percentage of completion of vaccine doses 85.7% and 88.1% in Saudi Arabia by Paul et al.,¹⁶ and Iran by Kabir et al.,¹⁷ respectively. On the other hand, Suckling et al., found that 12.8% of health workers were vaccinated in Kenya.¹⁸ Yet, this issue should be taken seriously by keeping HBV vaccination program mandatory for all healthcare providers.

Regarding the attitude of participants toward their patients, it was found that 32.2% of participants regard their patients as hepatitis-suspected. The same result was found in a study conducted in Tabriz in Iran by Mahdipour et al.¹⁹ This point should be emphasized since infectious diseases such as hepatitis and HIV infection may not have any clinical manifestations in the early stages, so each and every patient should be considered as a potential carrier of hepatitis and undergo screening test before being engaged in active dental management.

Participants were aware of the risk of their job as evidenced by their response to the direct question of the high risk of their job and to other questions like the possibility of transmission of the disease from infected health workers to their patients and the role of sharp objects in transmission of the disease. Unfortunately, only 22.6% of participants were aware of the hepatitis B management protocol. Regarding previous exposure to needle stick, 59.3% of the respondents were exposed to needle stick during practice, which is almost similar to the results of Dafaalla et al. (46%).²⁰ Nevertheless, there was low percent of injury reporting (16.4%) compared with Dafaalla et al. (34%) and Kabir et al. 28%;¹⁷ which reflects the literacy of the participants with PEP protocols. Therefore, it is highly recommended to implement workshops about PEP protocols.

STUDY LIMITATIONS

The limitations in our study include the small sample size, being a self-reported questionnaire, and being limited to the state of Khartoum only, which does not represent the whole country.

CONCLUSION

Knowledge of participants in this study toward HBV infection was good in regard to routes of transmission, preventive measures, risks, and the necessity to receive HBV vaccination. However, in spite of high level of knowledge of respondents, their behavior and practices were unsatisfactory. There is low level of HBV vaccination

completion rate and lack of knowledge about injection safety. The poor compliance of health workers to hepatitis B vaccination is an issue that deserves attention by authorized persons.

RECOMMENDATIONS

It is recommended to make hepatitis B vaccination mandatory for all dental healthcare providers and to conduct quality training among dental healthcare workers to prevent the spread of hepatitis B virus, which includes PEP, standard precautions for minimizing exposure risk, and patient management protocol.

CLINICAL SIGNIFICANCE

Dental healthcare workers are a high-risk group for acquiring hepatitis B infection putting them at risk of experiencing serious side effects such as chronic active hepatitis and other related issues. Moreover, there is a potential risk of transmission of the infection from dental healthcare providers to their patients. The majority of exposure in dentistry is preventable. Good awareness of dental health providers toward hepatitis B is crucial to design and apply preventive measures to control transmission and potential complications.

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