



BMJ Open Knowledge, attitude and prevalence of hepatitis B virus among healthcare workers: a cross-sectional, hospital-based study in Bamenda Health District, NWR, Cameroon

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ABSTRACT

Introduction Hepatitis B virus (HBV) is a bloodborne virus which can be transmitted via percutaneous and mucocutaneous exposure to infected body fluid. Healthcare workers (HCWs) who are continuously exposed to different body fluids are at an increased risk of contracting and transmitting this virus. It is thus important to evaluate the knowledge and attitude of HCWs towards HBV and the prevalence of HBV infection among them.

Methods This cross-sectional study was carried out between April and September 2017. Overall, 398 HCWs were recruited for this study. Knowledge on the route of HBV transmission and attitude towards HBV were evaluated using a well-structured questionnaire. Hepatitis B surface antigen (HBsAg) positivity was obtained using the Monolisa HBsAg ULTRA kit (Bio-Rad). Data were analysed using SPSS V.20.

Results Among the HCWs who participated in this study, 338 (84.9%) had heard of HBV, and 269 (67.6%) of them had adequate knowledge on the route of HBV transmission. Medical doctors were the most knowledgeable among biomedical workers and students (76.5%). The rate of stigma was highest among nurses (87, 38.8%). The prevalence of HBsAg positivity was high (42, 10.6%) given that there is an efficient and available vaccine. Overall, over 70% of HCWs invited to participate in this study responded.

Conclusion Knowledge on the route of HBV transmission was fair, and the level of stigmatisation of HBV-infected patients and the prevalence of HBV infection were high in this study. A sensitisation campaign should be carried out to educate HCWs on HBV, thus reducing the level of stigma associated with HBV as well as the probability of contracting HBV as a nosocomial infection.

INTRODUCTION

Hepatitis B virus (HBV) is an enveloped virus of the Hepadnavirus family that infects the liver, causing hepatocellular necrosis and inflammation. HBV, spread by percutaneous or mucosal exposure to infected blood and various body fluids, can cause either

Strengths and limitations of this study

- The Monolisa HBsAg ULTRA ELISA kit, which has 100% sensitivity and 99.28% specificity, was used to determine current hepatitis B virus infection (hepatitis B surface antigen (HBsAg) positivity).
- Questionnaires were answered in the presence of the researcher to prevent participants from discussing answers or getting answers online.
- Stratified sampling technique, which permits estimation of population parameters for groups within a population, was used for sampling.
- Information on knowledge and attitude was self-reported, and chances of individual bias cannot be completely over-ruled.
- The present study covers a cross section of health professionals, so caution should be taken while generalising the results.

an acute or chronic disease.¹ An estimated 257 million people are living with HBV,² and about 20%–30% of those who become chronically infected will develop complications. Currently available treatments fail to eradicate the virus in most of those treated, necessitating potentially lifelong treatment,³ and approximately 650 000 people die annually due to chronic hepatitis B.³ Cameroon, a sub-Saharan African country, is considered hyperendemic, with a prevalence rate of HBV infection estimated at 11.5%.⁴

Healthcare workers (HCWs), who are frequently in contact with blood and other body fluids in the course of their work, are at a higher risk of exposure to bloodborne viral diseases such as HBV, hepatitis C virus and HIV.^{5–7} Among the HCWs worldwide, about two million are exposed and about 70 000 are infected with HBV annually.⁷ The WHO global burden of the disease showed



that 37% of HBV among HCWs was due to occupational exposure resulting from sharp injuries.² More than 90% of these infections occur in developing countries.⁷ The risk of occupational infections in developing countries is intensified by a variety of factors, comprising but not restricted to overcrowding in hospitals, lower HCW to patient ratio, insufficient or absence of basic safety and protection equipment, reutilising/reprocessing contaminated needles and sharp instruments, and partial awareness of the risk of exposure to blood and body fluid.⁵

Although needle stick injury hepatitis seroconversion is somewhat rare, the costs of treatment and the anxiety about the possible consequences of an exposure are serious. This might be why some HCWs refuse to service patients with bloodborne viral diseases such as HBV. Prevention through immunisation and increasing knowledge thus stand out as the safest strategy against the high prevalence of viral hepatitis among HCWs. Knowing the facts and having proper awareness can influence the attitudes of HCWs and control the menace of the disease.⁸ A number of studies in Africa have evaluated the level of knowledge, attitude and practice of HCWs towards HBV and their vaccination status.^{9–12} The low level of vaccination and the high prevalence of hepatitis B surface antigen (HBsAg) recorded in different studies might be justified by the low level of knowledge on the route of transmission among HCWs.^{13–16}

Prevention remains a recommended safeguard against an epidemic of viral hepatitis. The knowledge and attitudes of the clinician play a key role in the prevention and spread of infection. By knowing the facts and having proper awareness and attitudes, the menace of this disease can be prevented to a great extent. Therefore, the objectives of the present study are to assess the knowledge and attitudes of HCWs regarding HBV and to compare their knowledge and attitude score with the prevalence of HBV infection.

MATERIALS AND METHODS

Study design and setting

This cross-sectional, hospital-based study was conducted among HCWs in Bamenda Health District, North West Region (NWR), Cameroon. Samples were collected between April and September 2017, and included 22 health facilities in this health district (one regional hospital, three CMAs (Centre medical d'arrondissement), six mission hospitals, five government health centres and seven private hospitals). Over 70% of HCWs in the various health facilities were recruited for this study. Testing stations were set up in the various wards of the health facilities.

Study participants

HCWs present in the selected hospitals during the study period were informed and invited to participate in the study. HCWs in the study comprised medical doctors, nurses, dentists, pharmacists, laboratory technicians,

sanitary workers and biomedical students working in Bamenda Health District during the study period.

Strategy for recruiting target population

Information was given through the chief medical doctor (where applicable), the general supervisor and the heads of units, who were contacted respectively and were asked to inform their staff of the project. An information notice was placed on the hospital and ward notice board, where applicable, to inform the hospital staff of the study objectives and the period during which the study was to be carried out. Finally, a one-to-one contact was used to reach a number of staff.

Sample size and justification

Sample size was determined using the population proportion sample size formula proposed by Scott Smith¹³: $X = Z\text{-score} \times SD \times (1 - SD) / MOE$. The proportion of HCWs in NWR was obtained from a registry published in 2015¹⁴ which published the national proportions of HCWs per region. The confidence level was 95%, giving a Z-score of 1.96, a margin of error (MOE) of ± 5 and an SD of 0.5. Using this formula, the calculated sample size was 385 persons.

Sample collection

Participants who consented to the study completed a structured questionnaire which was used to collect data on sociodemographic characteristics, HBV exposure risk, HBV vaccination and attitude towards HBV. Stratified sampling technique, which permits estimation of population parameters for groups within a population, was used for sampling. The questionnaire was self-administered and contained both closed and open-ended questions to assess the perspectives of the respondents on HBV. Participants who could read and write completed the form by themselves, while those who could neither read nor write were assisted. The questionnaire was filled in the presence of the researcher to prevent participants from discussing answers or getting answers online. Pre-designed and pretested, semistructured questionnaire items with response options were developed based on KAP (knowledge, attitude and practice/prevalence) surveys with similar objectives.^{15–17} The questionnaire was validated following the guidelines proposed by Jain *et al.*¹⁸ Serum was obtained from 4 mL of blood collected from study participants into a red cap (dry) tube. Identification number was used to link participants' laboratory results and the questionnaire. The questionnaire can be found in online supplementary file.

Definition for scoring knowledge

Knowledge on the route of HBV transmission was assessed using three questions directly linked with the route of HBV infection. Adequate knowledge was when a correct answer was given to all three questions. This minimum of three of three correct answers to define good level of knowledge may seem rigorous. However, this minimum level justified the reasonable difficulty of the questions.

Definition for scoring attitude

Attitude was assessed using six criteria: attitude towards HBV-infected persons, quality of hygiene (how often HCWs wash and/or disinfect their hands), frequency of glove use, frequency of needle stick injury, sexuality and vaccination status. Attitude was considered positive when a participant was able to correctly give at least five of the six expected answers. Having five of the six responses correct is deemed to have a positive attitude, as HCWs are at the forefront of healthcare provision and should have appropriate attitude towards HBV for others in the population to emulate.

HBV serology

HBsAg was tested using the Monolisa HBsAg ULTRA ELISA kit (Bio-Rad, Marnes-La-Coquette, France), a fully multivalent assay with high sensitivity in detecting HBV mutants to determine those who were positive for HBsAg.⁶ ELISA assay was performed following the manufacturer's instructions.

Statistical analysis

Data were analysed using SPSS V.20.0 for Windows. Descriptive statistics for demographic characteristics, percentages for categorical variables, and median and IQR for continuous variables were used to analyse the findings of the study. Pearson's χ^2 ($p < 0.05$) was used to assess the significance among the study variables, while OR was used to evaluate the strength of association between various variables.

Patient and public involvement statement

Patients and the public were not involved in designing the questionnaire, and collecting and analysing data for this study.

RESULTS

Sociodemographic characteristics of study participants

In each health facility in Bamenda Health District, over 70% of HCWs consented to participate in this study. Overall, a total of 398 HCWs across Bamenda Health District participated in this study. Among these, 272 (68.3%) were women. The (16–25) years old age group was the most represented (167, 42.0%), and the median age was 27.0 years (IQR, 23–32 years) at 95% CI (table 1). Most participants were nurses (56.6% of workers and 55.7% of students), had worked for 2–4 years and lived in an urban setting (84.2%).

Assessment of knowledge

A total of three questions were used to assess knowledge of HCWs from different hospitals in this region on the route of HBV transmission (table 2). Of the participants, 338 (84.9%) had heard of HBV. Most participants correctly identified sexual intercourse (313, 78.6%), mother-to-child transmission (292, 73.4%) and contact with body fluid (324, 81.4%) as routes of contamination with HBV. Among these, the medical doctors were the most

Table 1 Baseline characteristics of the studied population

Variables		Frequency (n) (N=398)	Percentage
Sex	Male	126	31.7
	Female	272	68.3
Age group (years)	16–25	167	42.0
	26–35	157	39.4
	36–45	50	12.6
	46–65	24	6.0
Level of education	Secondary and below	39	9.8
	Diploma	59	14.8
	SRN/SRM	55	13.8
	HND	103	25.9
	BSc	118	29.6
	Postgraduate	24	6.0
Duration in the occupation (years)	≤1	72	18.1
	2–4	218	54.8
	5–9	55	13.8
	≥10	53	13.3
HCW category	Nurses	224	56.3
	Lab technicians	90	22.6
	Medical doctors	17	4.3
	Dentists	15	3.8
	Pharmacists	8	2.0
	Sanitary workers	44	11.1
Role in the hospital	Biomedical student	149	37.4
	Biomedical personnel	249	62.6
Residence	Urban	335	84.2
	Semiurban	18	4.5
	Rural	45	11.3

HCW, healthcare worker; HND, Higher National Diploma; SRN/SRM, State Registered Nurse/Midwife.

knowledgeable regarding HBV (13, 76.5%), while not up to 50% of sanitary workers had heard of HBV before this study (table 3). Knowledge was significantly associated with level of education and HCW category ($p < 0.001$). Overall, these HCWs had an unsatisfactory level of knowledge on the route of HBV transmission (269, 67.6%). Knowledge on the route of HBV transmission was higher among biomedical students (104, 69.8%) compared with the personnel (165, 66.3%).

Attitude of HCWs towards HBV

Among the 398 HCWs, 270 (67.8%) had a positive attitude towards HBV-infected persons (table 4). Majority of

Table 2 Knowledge on the route of HBV transmission

Questions		Correct response, n (%)						Total (N=398)
		Nurses (n=224)	Medical doctors (n=17)	Lab technicians (n=90)	Dentists (n=15)	Pharmacists (n=8)	Sanitary workers (n=44)	
Heard of HBV	Yes	199 (88.8)	16 (94.1)	86 (95.6)	12 (80.0)	5 (62.5)	20 (45.5)	338 (84.9)
	No	25 (11.2)	1 (5.9)	4 (4.4)	3 (20.0)	3 (37.5)	24 (54.5)	60 (15.1)
Sexually transmitted	Yes	183 (81.7)	16 (94.1)	82 (91.1)	11 (73.3)	3 (37.5)	18 (40.9)	313 (78.6)
	No	41 (18.3)	1 (5.9)	8 (8.9)	4 (26.7)	5 (62.5)	26 (59.1)	85 (21.4)
Vertical transmission	Yes	179 (79.9)	14 (82.4)	69 (76.7)	9 (60.0)	5 (62.5)	16 (36.4)	292 (73.4)
	No	45 (20.1)	3 (17.6)	21 (23.3)	6 (40.0)	3 (37.5)	28 (63.6)	106 (26.6)
Contact with body fluids	Yes	191 (85.3)	15 (88.2)	84 (93.3)	11 (73.3)	5 (62.5)	18 (40.9)	324 (81.4)
	No	33 (14.7)	2 (11.8)	6 (6.7)	4 (26.7)	3 (37.5)	26 (59.1)	74 (18.6)
Knowledge on HBV	Yes	162 (72.3)	13 (76.5)	68 (75.6)	9 (60.0)	3 (37.5)	14 (31.8)	269 (67.6)
	No	62 (27.7)	4 (23.5)	22 (24.4)	6 (40.0)	5 (62.5)	30 (62.2)	129 (32.4)

HBV, hepatitis B virus.

HCWs practised safe hygiene (washed their hands often and/or used a disinfectant) (317, 79.6%) and wore gloves often (310, 77.9%) while administering treatment. Needle stick injury was highest among sanitary workers (3, 6.8%), while promiscuity (defined as having more than 10 sex partners in their lifetime, having sex with sex worker(s) and/or one-night stands) was highest among dentists (6, 40.0%). Only 93 (23.4%) HCWs reported receiving at least one dose of the vaccine, while 175 (44.0%) showed an overall positive attitude towards HBV (table 3). There was a significant association between HCW category and attitude towards HBV ($p=0.003$) (table 3).

Prevalence of HBsAg among HCWs

The prevalence of HBsAg positivity was 10.6% (table 3). No statistically significant association was observed between HBsAg positivity and the different classes involved in this study (table 3). Majority of those infected belonged to the 46–65 years age group (4, 16.7%), had worked for (5–9) years (7, 12.7%), had a State Registered Nurse/Midwife certificate (9, 16.4%), were nurses (28, 12.5%) and lived in an urban setting (38, 11.3%). No significant association was observed between knowledge on the route of HBV infection, attitude towards HBV and being positive for HBsAg (table 4). However, the prevalence of HBsAg positivity was higher among those with adequate knowledge on the route of HBV transmission (26, 61.9%) and lower among those with a positive attitude towards HBV (19, 45.2%) (table 5).

DISCUSSION

Exposure to bloodborne pathogens such as HBV infection remains a significant occupational hazard to HCWs, especially in countries where the prevalence of this infection is high. KAP studies among HCWs are necessary to evaluate and improve awareness on the route of transmission, prevention and management of infectious diseases. This study was carried out to assess the knowledge, attitude

and prevalence of HBV among HCWs in Bamenda Health District, NWR, Cameroon.

Assessment of knowledge

HCWs are at the forefront of healthcare provision, and it is expected that they know the routes of transmission of different infectious agents to protect their patients and themselves from nosocomial infections. The results of the current study revealed a significant association between HCW category, level of education and knowledge on the route of HBV transmission. This is similar to what was obtained in Sierra Leone,¹¹ Sudan¹⁹ and Northeast Ethiopia.²⁰ This may be justified by the fact that education trains individuals to acquire, evaluate and use information.²¹ This may justify the unequal access to and exploitation of educational resources, which increase with level of education²² as well as role in the health setting.

Even though majority of HCWs in this setting had heard of HBV infection prior to this study (338, 84.9%), only 269 (67.6%) had good knowledge on the route of HBV transmission. This is similar to the 62.5% obtained in Northern Tanzania⁹ and the 58.7% obtained in the South West Region of Cameroon.²³ However, this is higher than the 47.0% obtained in Yaoundé among HCWs,²⁴ 52% obtained in North West, Ethiopia,¹⁰ 29.9% obtained in Sierra Leone,¹¹ and 42.1% obtained in a rural population in NWR, Cameroon.²⁵ According to Abongwa *et al*,²⁵ the most probable reason for the low level of adequate knowledge on the route of HBV transmission could be inadequate health education programmes, forcing the population to get information on HBV from friends and/or relatives.²⁵ Getting information from friends, relatives and/or colleagues increases the probability of getting inappropriate information.

The level of current HBV infection was higher among those who had an adequate knowledge on the route of HBV transmission (26, 61.9%). This is contrary to what is anticipated¹⁵ given that better knowledge on the route

Table 3 Prevalence of HBV infection among HCWs

Characteristics	Knowledge on the route of transmission		Positive attitude		HBsAg positivity		
	n (%)	P value	n (%)	P value	n (%)	P value	
Sex	Male (n=126)	88 (69.8)	.513	61 (48.4)	.224	9 (7.1)	.132
	Female (n=272)	181 (66.5)		114 (41.9)		33 (12.1)	
Age group (years)	16–25 (n=167)	118 (70.7)	.169	74 (44.3)	.456	14 (8.4)	.532
	26–35 (n=157)	109 (69.4)		72 (45.9)		19 (12.2)	
	36–45 (n=50)	29 (58.0)		17 (34.0)		5 (10.0)	
	46–65 (n=24)	13 (54.2)		12 (50.0)		4 (16.7)	
Level of education	Secondary and below (n=39)	11 (28.2)	<.001	14 (35.9)	.186	3 (7.7)	.771
	Diploma (n=59)	36 (61.0)		23 (39.0)		6 (10.2)	
	SRN/SRM (n=55)	36 (65.5)		22 (40.0)		9 (16.4)	
	HND (n=103)	79 (76.7)		42 (40.8)		10 (9.7)	
	BSc (n=118)	88 (74.6)		64 (54.2)		12 (10.2)	
	Postgraduate (n=24)	19 (79.2)		10 (41.7)		2 (8.3)	
Duration in the occupation (years)	≤1 (n=72)	45 (62.5)	.649	30 (41.7)	.217	7 (9.7)	.601
	2–4 (n=218)	157 (72.0)		101 (46.3)		23 (10.6)	
	5–9 (n=55)	34 (61.8)		21 (38.2)		7 (12.7)	
	≥10 (n=53)	33 (62.3)		23 (43.4)		5 (9.4)	
HCW category	Nurses (n=224)	162 (72.3)	<.001	87 (38.8)	.003	28 (12.5)	.640
	Lab technicians (n=90)	68 (75.6)		54 (60.0)		8 (8.9)	
	Medical doctors (n=17)	13 (76.5)		9 (52.9)		1 (5.9)	
	Dentists (n=15)	9 (60.0)		9 (60.0)		2 (13.3)	
	Pharmacists (n=8)	3 (37.5)		2 (25.0)		1 (12.5)	
	Sanitary workers (n=44)	14 (31.8)		14 (31.8)		2 (4.5)	
	Biomedical students (n=149)	104 (69.8)	.466	65 (43.6)	.914	13 (8.7)	.359
	Biomedical personnel (n=249)	165 (66.3)		110 (44.2)		29 (11.6)	
Residence	Urban (n=335)	229 (68.4)	.523	152 (45.4)	.408	38 (11.3)	.492
	Semiurban (n=18)	10 (55.6)		6 (33.3)		1 (5.6)	
	Rural (n=45)	30 (66.7)		17 (37.8)		3 (6.7)	

Bold P value <.05 is considered statistically significant.

HBsAg, hepatitis B surface antigen; HBV, hepatitis B virus; HCW, healthcare worker; HND, Higher National Diploma; SRN/SRM, State Registered Nurse/Midwife.

of disease transmission should help the individual take precautions against getting an infection. The disparity observed in this study can be explained by the same principle underlined above: inadequate health education programmes forcing the population to get information on HBV from friends, relatives and/or colleagues.²² This can thus justify the fact that most of the infected HCWs were chronic carriers who, after their first diagnosis or exposure to HBV, were directed to gastroenterologist

for follow-up. Gastroenterologists also have the role of educating their patients on the disease.

Assessment of attitude of HCWs towards HBV

There was a significant association between HCW category and attitude towards HBV ($p=0.003$). Even though 270 (67.8%) HCWs had a positive attitude (behaviour) towards HBV-infected persons, only 175 (44.0%) showed an overall positive attitude towards HBV. The poor attitude

Table 4 Attitude of healthcare workers towards hepatitis B virus

Attitudes		Healthcare workers, n (%)						
		Nurses (n=224)	Medical doctors (n=17)	Lab technicians (n=90)	Dentists (n=15)	Pharmacists (n=8)	Auxiliary workers (n=44)	Total (N=398)
Attitude towards infected persons	Good	137 (61.2)	13 (76.5)	70 (77.8)	13 (86.7)	5 (62.7)	32 (72.7)	270 (67.8)
	Bad	87 (38.8)	4 (23.5)	20 (22.2)	2 (13.3)	3 (37.5)	12 (27.3)	128 (32.2)
Practise safe hygiene	Yes	193 (86.2)	14 (82.4)	63 (70.0)	14 (93.3)	6 (75.0)	27 (61.4)	317 (79.6)
	No	31 (13.8)	3 (17.6)	27 (30.0)	1 (6.7)	2 (25.0)	17 (38.6)	81 (20.4)
Wears gloves often	Yes	177 (79.0)	15 (88.2)	82 (91.1)	10 (66.7)	4 (50.0)	22 (50.0)	310 (77.9)
	No	47 (21.0)	2 (11.8)	8 (8.9)	5 (33.3)	4 (50.0)	22 (50.0)	88 (22.1)
Frequency of needle stick injury	Often	10 (4.5)	0 (0.0)	1 (1.1)	0 (0.0)	0 (0.0)	3 (6.8)	14 (3.5)
	Rarely	214 (95.5)	17 (100.0)	89 (98.9)	15 (100.0)	8 (100.0)	41 (93.2)	384 (96.5)
Received one dose of vaccine	Yes	43 (19.2)	4 (23.5)	28 (31.1)	10 (66.7)	3 (37.5)	5 (11.4)	93 (23.4)
	No	181 (80.8)	13 (76.5)	62 (68.9)	5 (33.3)	5 (62.5)	39 (88.6)	305 (76.6)
Sexually promiscuous	Yes	46 (20.5)	4 (23.5)	10 (11.1)	6 (40.0)	2 (25.0)	16 (36.4)	84 (21.1)
	No	178 (79.5)	13 (76.5)	80 (88.9)	9 (60.0)	6 (75.0)	28 (63.6)	314 (78.9)
General attitude	Positive	87 (38.8)	9 (52.9)	54 (60.0)	9 (60.0)	2 (25.0)	14 (31.8)	175 (44.0)
	Negative	137 (61.2)	8 (47.1)	36 (40.0)	6 (40.0)	6 (75.0)	30 (68.2)	223 (56.0)

of the majority of HCWs towards HBV in this study may be justified by the level of inadequate knowledge on the route of HBV transmission in this population.^{8 15}

The prevalence of current HBV infection was lower among those with a positive attitude towards HBV (19, 45.2%). Developing a positive attitude towards a disease is generally associated with acquiring adequate knowledge on that disease, as discussed earlier.^{8 15} This might justify the lower prevalence of current HBV infection among those with positive attitude towards HBV.

Prevalence of HBV among HCWs

Various epidemiological and cross-sectional studies have reported marked variation in the prevalence of HBsAg among HCWs. Studies carried out among HCWs in Africa showed a prevalence of 1.8% in Libya,²⁶ 2.9% in Rwanda,²⁷ 7.0% in Tanzania²⁸ and 8.1% in Uganda.²⁹ This study revealed a relatively high burden of current HBV infection (10.6%) among HCWs in Cameroon. The high prevalence of HBV in this study population is similar to

the HBV prevalence obtained in a similar study carried out in Yaoundé,²⁴ but higher than the 8.7% obtained in a national survey among HCWs.³⁰ The difference in the prevalence of HBV could be due to the different diagnostic techniques used. The high prevalence of HBV infection obtained among HCWs in Cameroon may be a reflection of the prevalence of HBV infection in the general Cameroonian population, which is estimated at 11.5%,⁴ or the lack of adequate knowledge on the route of HBV transmission among these HCWs.¹⁵

The prevalence of HBV positivity was low in the (16–25) years age group and could be justified by the expanded immunisation between 1990 and 2005, which led to a decrease in HBV infections in most regions particularly in central sub-Saharan Africa.³¹ Furthermore, most students were in the (16–25) years age group and thus had just started working in health facilities.

This was a cross-sectional study, which implies that participants were met only once. There was no follow-up

Table 5 Association between knowledge, attitude and prevalence of HBsAg

Characteristics		Reactivity to HBsAg			Unadjusted risk of HBsAg	
		n	%	P value	OR	95% CI
Knowledge (n=42)	Adequate	26	61.9	.405	1.323	0.683 to 2.564
	Poor	16	38.1			
Attitude (n=270)	Positive	19	45.2	.861	0.994	0.497 to 1.795
	Negative	23	54.8			

P value <.05 is considered significant.

HBsAg, hepatitis B surface antigen.

to determine the outcome of the infection. Besides, data on knowledge and attitude were self-reported and could be subject to individual bias. Finally, no serological test was performed to evaluate the level of vaccination coverage in this at-risk population. This implies that the number of HCWs immunised against HBV is lower than what is reported in this study. This negative attitude among HCWs can be justified by the high cost of the vaccine, the lack of adequate supply and/or the simple fear of receiving the vaccine provoked by the many myths surrounding vaccination in some settings.³²

CONCLUSION

The level of knowledge on the route of HBV transmission observed in this study is fair. This lack of adequate knowledge might justify the relatively high prevalence of HBsAg positivity, the overall negative attitude towards HBV and the low rate of vaccination among HCWs in this area. Given that knowledge is usually the first step towards modification of a desirable behaviour, HBV campaigns should be organised to sensitise HCWs on this disease. The campaign can include improved mass media programmes, such as broadcasting health talk intermittently online and/or within other television programmes. Adequate sensitisation will reduce the rate of stigma associated with the disease and probably the rate of new infections among HCWs.

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Contributors EA and CT designed the study. EA and VF performed the experiments. EA drafted the manuscript. CT, RN, LA and J-RK were involved in editing the manuscript. EA performed the statistical analysis. All authors read and approved the final manuscript.

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