

# Hospital Management of Viral Hepatitis B: Unveiling Skills of Healthcare Workers in Northern Cameroon

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## ABSTRACT

**Background:** The burden of viral hepatitis is a major public health concern in resource-limited countries where more than 90% of an estimated 3 million percutaneous exposures occur annually among 35 million healthcare workers worldwide. In Cameroon, the prevalence of viral hepatitis B (HBV) is 8% in the general population and more than 15% in the Northern Region, making it one of the most affected countries in sub-Saharan Africa. This study aims to evaluate the competences of health workers in the management of viral hepatitis in an endemic settings of northern region of Cameroon.

**Methods:** A hospital-based cross-sectional study was conducted from January to July 2022 in Northern Cameroon. A consecutive, non-probabilistic and exhaustive sampling method were used to select all 366 healthcare workers from 15 eligible participating health facilities including 12 District Hospitals and 3 Sub-divisional Medical Centers. A self-administer questionnaire were used for data collection. Data were analyzed using SPSS version 20.0 software. A p-value < 0, 05 was considered significant.

**Results:** A total of 366 healthcare workers were enrolled in the study. Male were the most represented (51.6%) with a sex ratio M/F of 1.07. The mean age was 33.13±8.36 years. Caregivers represented the majority of our sample at 36.1%. When assessing knowledge, the results indicated that half of the nursing staff, almost 58% of the sample, had average knowledge. It is also noticed that 10% of health workers have poor knowledge and 8% have good knowledge. On the other hand, the evaluation of the attitudes of health workers on viral hepatitis revealed that 42%, 31%, 23%, 4% of our sample presented respectively harmful, approximate, erroneous and correct attitudes. The findings also indicated that 58% and 24% of the health workers in the sample presented inadequate and harmful practices. Moreover, about 18% of health workers presented adequate practices in the management of viral hepatitis in the hospital settings.

**Conclusion:** The skills of health workers regarding hepatitis B management are insufficient. The knowledge, attitudes and practices of healthcare workers were unsatisfactory. It is therefore important to strengthen the skills of health workers so that they are better equipped to manage hepatitis B of the population in endemic settings of resource-limited northern region of Cameroon.

**Keywords:** Hospital management, viral hepatitis B, unveiling skills, healthcare workers, Northern Region, Cameroon.

## INTRODUCTION

The high burden of viral hepatitis is a major public health concern worldwide. More than two billion people are infected with hepatitis B virus (HBV), and more than 257 million are chronically infected [1]. An

estimated 3 million percutaneous exposures occur annually among 35 million healthcare workers worldwide, with more than 90% occurring in resource-limited countries [2].

Much more infectious than HIV (50 to 100 times more infectious), HBV is the most stable blood-borne virus [1]. It is transmitted from person to person through contact with blood or infectious body fluids. This situation makes healthcare workers one of the groups most vulnerable exposure to occupational infection [2]. Studies conducted in countries with low HBV endemicity have shown that the prevalence of HBV infection among healthcare workers is often 10 times higher than in the general population [3].

The hepatitis B vaccine is effective at the individual and community levels. It makes it possible to reduce the prevalence of people carrying HBV and thus the number of potentially contaminating people, enabling the reduction of the incidence of hepatitis B and its complications in the short term (fulminant hepatitis) and in the long term (cirrhosis and hepatocellular carcinoma) [4]. The development of universal early vaccination programs has significantly reduced the incidence of chronic HBV infection in the pediatric population in areas of high endemicity. Despite a decline in anti-HBs antibody levels after vaccination, vaccine efficacy persists and has led to a reduction in the incidence of chronic HBV infection in young adults vaccinated in childhood [5].

The prevalence of hepatitis B is between 8% and 12% in most countries in sub-Saharan Africa [6]. In Côte d'Ivoire, the seroprevalence of HBsAg has been estimated at 9% of the general population [7]. In Mali, the prevalence of infection is determined by piecemeal studies. The prevalence rate of viral hepatitis B is estimated to be between 15% and 17% according to several studies involving limited risk populations such as blood donors and biomedical analysis laboratory workers, compared to 4%-5% for hepatitis C [8]. Several studies carried out in Cameroon show that the prevalence of HBsAg is high and varies according to geographical area, age groups and specific population groups. The national prevalence of viral hepatitis B is 8.3% in the 15-64 age group. The regional variation in prevalence allows Cameroon to be divided into three endemic areas: regions with high prevalence (>15%: Far North, North), regions with moderate prevalence (8% - 15% (Center, Littoral, South, East, South-West, Adamaoua, West) and regions with low prevalence (<8%: North-West) [9]. .

The most studies carried out in Africa have shown that the nursing staff have knowledge-reduced risks linked to HBV infection [10]. A study carried out on the Knowledge, attitudes and practices of doctors and midwives of CSrefs in the Bamako district in terms of hepatitis screening revealed that approximately 70% of the nursing staff in the reference health centers of the city of Bamako have good knowledge about screening for viral hepatitis B, but in practice more than half of the staff do not offer this screening to their patients, even when faced with patients with exposure risk factors to HBV. Very few healthcare workers have received continuing training in hepatitis B screening, which would explain the low use of the screening tool by healthcare workers. The vaccination coverage of these workers for hepatitis B remains insufficient even though they are exposed daily to the risk of **AES**. Urgent actions are therefore needed to strengthen the fight against hepatitis [11]. Adequate knowledge, attitudes and practices consistent with staff standards caregiver should help reduce the risk of contamination in a hospital setting. The objective of this study was to evaluate the knowledge, attitudes and practices of healthcare workers regarding the risk of HBV contamination in hospitals in the Northern Cameroon Region.

## METHODS

**Study design and period:** A cross-sectional study was conducted during the period of five months from May to August 2022. Interviews of participants were carried out from May to July, while data entry and analysis were performed in August 2022.

**Study site:** The study was carried out in the Northern region. Data collection were collected in fifteen health facilities including twelve District Hospitals (DH) and three Sub-Divisional Medical Centres (DMC). The district hospitals were Bibemi, Figuil, Gashiga, Guider, Lagdo, Mayo-Oulo, Ngong, Pitoa, Poli, Rey-Bouba, Tcholire, Touboro and the Sub-Divisional medical centers were Lainde, Golombe and Bockle.

**Study population:** The study population consisted of all health workers (doctors, nurses, caregivers, laboratory technicians) working in twelve district hospitals and three DMCs in the northern region.

**Sample Type and Size:** The study used a consecutive, non-probability and exhaustive sampling of all staff who agreed to participate in the study. The minimum sample size was obtained using the statistic formula,  $n = Z^2 \alpha/2pq/i^2$ , where the reduced centered distribution ( $Z\alpha/2$ ) of 1.96 was taken.

**Inclusion criteria:** Included in the study were all health workers from the targeted DH and DMCs who agreed to complete informed consent.

**Non-inclusion criteria:** Excluded from the study were all health workers serving in the selected health facilities who had given their consent with an incomplete survey form.

**Data collections:** Data collection was carried out using a pre-coded questionnaire consisting of 13 main questions. Data were collected within selected health facilities after obtaining authorization and informed consent from the healthcare workers. The interviews were conducted in the privacy of a suitable space previously requested from the administration of the various selected health facilities, and the interview was carried out consecutively. The healthcare workers interviewees were installed comfortably as possible and after explaining the study purpose to them, the questionnaires were administered and the answers being recorded on the same sheet. At the end of each interview, some health education regarding viral hepatitis was given to healthcare workers.

**Data processing and analysis:** Data processing was carried out using SPSS version 20.0 software on the basis of the dimension matrix. Given that each correct answer was worth 1 point, the evaluation of the knowledge, attitudes and practices of the health workers on viral hepatitis B was done on the basis of the evaluation grid established by ESSI et al [32] for knowledge, attitudes and practices (KAP) surveys as described in Table 1 below.

**Table 1:** Study evaluation grid used to assess healthcare workers KAP

Dimension	Rating (%)			Rating
	Doctor	Nurse	Assistant-nurse	
Knowledge	>85	>70	>55	Good
	65 - 85	50 - 70	35 - 55	Average
	50 - 65	25 - 50	20- 35	Insufficient
	<50	<25	<20	Poor
Attitude	>85	>70	>55	Right
	65 - 85	50 - 70	35 - 55	Approximate
	50 à 65	25 à 50%	20 - 35	Erroneous
	<50	<25	<20	Harmful
Practice	>85	>70	>55	Adequate
	65- 85	50 - 70	3 - 55%	Inadequate
	<65	<50	<35	Harmful

The data analysis was performed following 2 processes: firstly, a descriptive analysis of the data and then secondly a bivariate analysis using the chi-square test, highlighting the degree of association between the level of knowledge of viral hepatitis of healthcare workers, their attitude towards the disease, and the prevention and management practices of the disease. A p-value <0.05 was considered significant.

## RESULTS

### Socio-professional characteristics of healthcare workers

Males represent the majority of healthcare workers (189 or 51.6%) for a sex ratio of 1.07. The most represented age group was under 30 years old with 47.8% followed by that of 30-40 years old with 35%. The average age was 33.13±8.36. The most common professions were nurses (70.8%) while doctors represented 6.3%. On average, 78% of healthcare workers surveyed had been in practice for less than 10 years as shown in Table 2.

**Table 2:** Socio-professional characteristics of healthcare workers (n =366)

Variable	Count (n)	Frequency (%)
Age (year)		
≤30	175	47.8
30 - 40	128	35.0
40-50	47	12.8
≥50	16	4.4
Sex		
Male	189	51.6
Female	177	48.4
<b>Professional status</b>		
Doctor	23	6.3
Nurse	259	70.8
Midwife	28	7.6
Laboratory technician	56	15.3
Years of experience		
0-10 ans	286	78.2
11-20 ans	63	17.2
21-30 ans	17	4.6

### Descriptive statistics of knowledge, attitudes and practices of healthcare workers

It appears that all health workers had already heard of viral hepatitis B and that 97.8% of workers knew that the agent responsible for hepatitis B, although 2.2% thought that it's a bacteria. Concerning the complications of viral hepatitis B, the best known to healthcare workers was cirrhosis at 60.4%, then they cited the CPF and cirrhosis association. Concerning the modes of transmission of viral hepatitis B, it is noted that 46.4% of healthcare workers responded the association between biological fluid and mother-to-child transmission and sex and medical procedure; followed by 19.1% of healthcare workers for biological fluids. The most represented means of prevention against the hepatitis B virus was the combination of vaccination, IEC, sterilization and single-use equipment at 56.8% followed by vaccination only at 20.2% of healthcare workers. The data in table that 59% were vaccinated with only 27.6% whose vaccination was complete. About 29.8% of unvaccinated healthcare workers was not because of the high cost according to them, 32.8% because of lack of information, 5% due to cost and lack of information. We also observe that more than half (60%) would like to be vaccinated. The results also showed that 99% of healthcare workers performed medical procedures and 46.7% surgical interventions. The number of treatments performed per week was more than 10 times with a

rate of 51.4% and the number of surgical procedures performed per week was less than 10 times per week. It is observed 97.8% of healthcare workers washed their hands when providing care, 96.4% of healthcare workers wore gloves, 75% of workers wore masks and 13.7% wore protective glasses.

**Assessment of the knowledge, attitudes and practices of healthcare workers in the management of viral hepatitis**

Data in table 3 present the knowledge, attitudes and practices of healthcare workers in the management of viral hepatitis. When assessing knowledge, it is noted that almost 58% of healthcare workers had average knowledge on viral hepatitis management, while about 10% of healthcare workers had poor knowledge and only 8% had good knowledge. On the other hand, the evaluation of healthcare workers’ attitudes on viral hepatitis reveals that 42%, 31%, 23% of the sample presented respectively harmful, approximate and erroneous attitudes. These results seem contradictory given that 3.8% of the healthcare workers presented correct attitudes. It is also noted that 58% and 24% of the healthcare workers in the sample presented inadequate and harmful practices. On the other hand, it can be noticed contradictorily that 18% of healthcare workers presented adequate practices.

**Table 3:** Knowledge, attitudes and practices related to the management of viral hepatitis B among healthcare workers in North Health Facilities, July 2022 (n=366)

Quality of KAP	Count (n)	Frequency (%)
<b>Knowledge</b>		
Poor	37	10.1
Insufficient	87	23.8
Average	212	57.9
Good	30	8.2
<b>Attitudes</b>		
Harmful	155	42.3
Erroneous	84	23.0
Approximate	113	30.9
Right	14	3.8
<b>Practices</b>		
Harmful	88	24.0
Inadequate	212	58.0
Adequate	66	18.0

**Analyzing the influence of knowledge on attitudes and practices**

Knowledge, Attitudes and Practices

By comparing knowledge with attitudes, it is noted that overall 42.4% (155/366) of healthcare workers had harmful attitudes among which 13.5% had poor knowledge, 25.2% with insufficient knowledge, 52.9% with average knowledge and only 8.4% with good knowledge of viral hepatitis management. About 23% (84/366) of healthcare workers had wrong attitudes among which 8.3% had poor knowledge, 27.4% with insufficient knowledge, 56% with average knowledge and 8.3% with good knowledge of viral hepatitis management. About 31% (113/366) of healthcare workers had approximate attitudes out of which a large proportion 66.4%



with average knowledge, 19.5% with insufficient knowledge, 8% with good knowledge and 6.2% with poor knowledge of viral hepatitis management. Among 8.2% (14/366) of healthcare workers who had right attitudes, 57.9% had average knowledge, 23.8% with insufficient knowledge, 10.1% with poor knowledge and 8.2% with good knowledge. All these findings with non-statistical significant difference ( $p < 0.566$ ) demonstrate that there may not be a direct influence between healthcare workers' knowledge of viral hepatitis B and their attitudes towards the disease management.

On the other hand, the link between the knowledge of healthcare workers on viral hepatitis B with their management (prevention and treatment) practices reveals that about 24.1% (88/366) healthcare workers had harmful practices among which 11.4% with poor knowledge, 25% with insufficient knowledge, 58% with average knowledge and 5.7% with good knowledge. About 57.9% (212/366) of healthcare workers had inadequate practices out of which 7.5% with poor knowledge, 23.4% with insufficient knowledge, 61.3% with average knowledge and 8% with good knowledge. Among 18% (66/366) of healthcare workers who had adequate practices, 16.7% had poor knowledge, 24.2% with insufficient knowledge, 47% with average knowledge and 12.1% with good knowledge. All these findings with a non-statistical significance ( $p < 0.228$ ) indicate that there may not be a direct influence between the level of knowledge of healthcare workers on viral hepatitis B and their management practices for the disease.

**Table 4:** Result of combining the knowledge, attitudes and practices of the health professional with their disease prevention and management practices related to the management of viral hepatitis B in North health facilities, July 2022 (n= 366)

	Knowledge n (%)					
Attitudes	Poor	Insufficient	Average	Good	Total	p-value*
Harmful	21(13.5)	39(25.2)	82(52.9)	13(8.4)	155(42.4)	
Wrong	7(8.3)	23(27.4)	47(56.0)	7(8.3)	84(23.0)	0.566
Approximate	7(6.2)	22(19.5)	75(66.4)	9(8.0)	113(30.9)	
Right	2(14.3)	3(21.4)	8(57.1)	1(7.1)	14(8.2)	
Total	37(10.1)	87(23.8)	212(57.9)	30(8.2)	366(100)	
Practices	Poor	Low	Average	Good	Total	p-value*
Harmful	10(11.4)	22(25.0)	51(58.0)	5(5.7)	88(24.1)	
Inadequate	16(7.5)	49(23.4)	130(61.3)	17(8.0)	212(57.9)	0.228
Adequate	11(16.7)	16(24.2)	31(47.0)	8(12.1)	66(18.0)	
Total	37(10.1)	87(23.8)	212(57.9)	30(8.2)	366(100)	
	Attitudes n (%)					
Practices	Harmful	Wrong	Approximate	Right	Total	p-value*
Harmful	19(13.5)	39(25.2)	58(52.9)	13(8.4)	130(35.5)	
Inadequate	6(8.3)	36(27.4)	65(56.0)	7(8.3)	114(31.1)	0.225
Adequate	6(6.2)	22(19.5)	85(66.4)	9(8.0)	122(33.4)	
Total	32(10.1)	97(23.8)	208(57.9)	29(8.2)	366(100)	
*Fisher exact test						

**Attitudes and practices**

With regards to the relationship between attitudes and practices, the results revealed that overall 33.4%

(122/366) of healthcare workers had adequate practices out of which about 8% had right attitudes and 66.4% had approximate attitudes while 6.2% had harmful attitudes and 19.5% had wrong attitudes in the management of viral hepatitis. About 31.1% of healthcare workers had inadequate practices among which 8.3% with right attitudes, 56% with approximate attitudes, 27.4% with wrong attitudes and 8.2% with harmful attitudes. Among 35.5% (130/366) of healthcare workers who had harmful practices, 13.5% still had harmful attitudes, 25.2% with wrong attitudes, 52.9% with approximate attitudes and 8.4% with right attitudes. All these findings with a statistical non-significant ( $p < 0.225$ ) thereby indicating that there may not be direct influence between the attitudes of the healthcare workers towards the viral hepatitis and their management practices of the disease.

## DISCUSSION

Overall, a total number of 366 healthcare workers were sampled in this study with the male represented 51.6% compared to 48.4% for the female making a sex ratio of 1.07. The average age was  $33.13 \pm 8.36$  years and the most represented age group was under 30 years old with 47.5% following with the group of 30-40 years old with 35%. This result is similar to that of a study carried out among healthcare workers in the capitals of northern Cameroonian regions in 2013 [30] which found a predominance of the age group ranging from 26-30 years and 31-35 years and the rank of caregivers in its study population. This could be justified by the ever-increasing number of training schools for nursing and healthcare assistants which are for the most part the main suppliers of relatively young staff to these health facilities. This would also explain why the seniority of the healthcare workers sampled was relatively small, varying between 0-10 years.

Generally, within the study population, we found almost half (57.9%) of healthcare workers had average knowledge about HVB and only 10.1% had insufficient knowledge. These results are comparable to those obtained by a previous study [23], in which 82 people had heard of HVB and 89.2% cited the virus as the causative agent.

Regarding the agent responsible for HVB, the viral hepatitis B virus was known by the majority (97.8%) of healthcare workers. This result is relatively higher than those of other studies [23, 24] which found that 86.1% of healthcare workers knew the virus as the responsible agent of HVB. Concerning the complications of HBV, liver cirrhosis was mentioned by 60.4% of healthcare workers followed by CPF + liver cirrhosis with 15.6% of healthcare workers. Another study [32] found similar results in his study with liver cirrhosis as the better known complication by 61.5% of healthcare workers.

Concerning the modes of transmission of HVB in Cameroon, healthcare workers had general knowledge but not the precision of the main modes of transmission found in Cameroon. Thus, healthcare workers mentioned in order of importance biological fluid (19.1%), mother to child transmission about 3.3%. These results are different from those obtained by other study [29] where about 38.8% of healthcare workers cited the blood route as the main mode of transmission and the blood-sexual-mother-child trio was cited by 10% of healthcare workers. This could be explained by the fact that in this study we specified the main modes of transmission in Cameroon while in the other it was a question of knowing all the modes of transmission of HVB.

The means of prevention most cited by healthcare workers was vaccination, with about 80.3%, followed by single use of small equipment with 57.2% of healthcare workers, and finally sterilization of equipment with about 53.2% of healthcare workers. It is also noted that 19.7% of healthcare workers did not know any means of preventing HVB. These results are similar to those of a study carried out in 2013 [28] which found that about 19.1% of healthcare workers did not know any preventive measures of HVB. This could be justified by the fact that hepatitis B is only reserved free of charge for children aged 0-5 in the expanded program of immunization, many healthcare workers did not have the financial access for HVB vaccination and others no access to good related information.

The HVB prevention program was known by 39.6% of healthcare workers while 60.4% declared that they were aware of the existence of a national program to fight against HVB. These results are different from those

obtained by a study [23] who found that the HVB prevention program within the CHU was known by 40.86% of the healthcare workers while 34.6% declared that they were aware of the existence of a national program to fight against HVB.

In this study, about 41% (150/366) of healthcare workers were vaccinated against HVB and 59% had not received any dose of vaccine. Among the 150 vaccinated, about 67.3% (101/150) of healthcare workers had received three doses of vaccine. These results are close to those reported in the literature where about 23.7% of the joint sample from the northern regions of Cameroon in 2013 [30] declared being vaccinated against viral hepatitis B, about 30.9% of the respondents from the North- West and central Cameroon in 2012 [29] and about 60% of that of a study carried out on healthcare workers in Mali [23] also declared to be vaccinated against viral hepatitis B. However, this result found in this study were much higher than that of East Cameroon in 2012 [28] which was only about 7.5% of healthcare workers vaccinated against HVB. In this study, healthcare workers who were not vaccinated or who had received an incomplete vaccination cited the lack of information as the main reason, by about 32.8%, and the high cost, by about 29.8% of healthcare workers. This result is close to a study carried out in Mali [23] which mentioned that healthcare workers who were not vaccinated or who had received an incomplete vaccination cited as the main reason the lack of information by about 26.1% and the high cost by 17.8% of healthcare workers.

These considerable lack of vaccination, or even the non-use of protective glasses and the failure to recapping needles are undoubtedly the consequence of the poor attitudes of health workers towards the disease. In short, overall attitudes, very few about 3.8% of healthcare workers presented correct attitudes towards the viral hepatitis management necessary for better care of patients. This study found that about 97.8% (358/366) of healthcare workers used to wash their hands at the time of care, and about (96.4%) (353/366) of healthcare workers wore gloves at the time of care to patients. Some healthcare workers did not wash their hands for the following reasons: did not see any use (3%), due to negligence (1.6%). Others healthcare workers did not wear gloves for the following reasons: unavailability (3%), did not see any use (1.1%). The fact of not wearing a mask and protective glasses was mainly due to their absence with respective frequencies of 18.9% and 80.6% of healthcare workers. Some did not re-cap the syringes after use and 29.2% of healthcare workers behave like that because of ignorance. Other respondents did not use security boxes due to their non-availability (3%), because they did not see their usefulness (3%). These results are similar to those reported in the literature done in Mali [28] which mentioned that apart from the wearing of masks which was not practiced by 63.43% of healthcare workers and the wearing of protective glasses which was not carried out by 78.57% of healthcare workers, the other preventive measures at the time of care were respected: this involved washing hands by about 76% of healthcare workers, wearing gloves 95.1% of healthcare workers, not recapping the needles 32.57% of healthcare workers, use of security boxes 93.71% of healthcare workers. The main reason given for non-compliance with these measures (wearing a mask and protective glasses) was their absence at the hospital settings with 97.3% and 98.2 of healthcare workers respectively.

### **Limitation**

Throughout this research work, there was a problem of difficult access to the different data collection sites because they were not located close to each other. The long distances to travel between its different sites in order to obtain the maximum amount of data and the financial cost that this represented were equally difficult to overcome.

### **CONCLUSION**

This study consisted of a cross-sectional survey of healthcare workers aiming to evaluate the skills of healthcare workers in the management of viral hepatitis B in the hospitals of the Northern Region of Cameroon. The findings highlighted the level of knowledge of healthcare workers on viral hepatitis B thereby analyzing the attitudes and practices of healthcare workers in hospitals in the Northern region regarding HVB management measures. There was no significant association between the low level of knowledge of healthcare workers regarding the management of viral hepatitis B and their attitudes towards the disease on the one hand and between their low levels of knowledge on the other hand knowledge and practice of prevention and care providing to the populations.



## Declaration

**Author's contribution:** Drafting of the protocol, data collection, analysis and interpretation: MA and NZ; Drafting of original manuscript: MA, NZ and FZLC; Critical revision of the manuscript: FZLC KM and NZ; Conception, design, supervision of implementation, editing and final validation of the manuscript:

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**Ethical Approval Statement:** The protocol was approved by Institutional Review Board (IRB) of the Faculty of Medicine and Biomedical Sciences of Yaoundé and the ethical clearance issued. Informed consent was obtained from participants prior to inclusion in the study.

**Declaration of interests:** All authors declare no conflict of interest and approve the final article.

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