

# Hepatitis B Knowledge, Attitude and Vaccination Status among Nurses of Tamale Central Hospital, Ghana

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## Abstract

**Background:** In our healthcare setting transmission of hepatitis B is a big challenge to handle for both patients and healthcare providers especially those in frequent contact with blood. *Objectives:* To determine Hepatitis B knowledge, attitude, and vaccination status among nurses of Tamale Central Hospital.

**Methods:** This study was conducted using a descriptive cross-sectional survey. Data analysis was done with SPSS version 20. Bivariate analysis was done using chi-square to determine the relationships.

**Results:** The study recorded a response rate of 92.5%. Majority (59.6%) had high, 36.4% had moderate and 4.0% had low knowledge hepatitis B. Hepatitis knowledge level was associated with: age  $X^2(4) = 17.789$ ,  $P = 0.001$ , sex,  $X^2(2) = 13.203$ ,  $P = 0.001$ , educational level,  $X^2(6) = 17.552$ ,  $P = 0.007$ , nursing category,  $X^2(4) = 19.226$ ,  $P = 0.001$ , and duration of nursing practice  $X^2(2) = 19.492$ ,  $P \leq 0.001$ . About 42.9% had positive attitude toward hepatitis B prevention and attitude level towards hepatitis B was associated with: marital status  $X^2(1) = 11.090$ ,  $P = 0.001$ , residential address  $X^2(2) = 11.411$ ,  $P = 0.003$  and duration of nursing practice  $X^2(1) = 4.769$ ,  $P = 0.029$ . About 84.8% of nurses started vaccination against hepatitis B and 77.3% completed at least three doses of the vaccination. The only factor with a statistically significant relationship with vaccination completeness status was respondent marital status  $X^2(1) = 8.063$ ,  $P = 0.005$ .

**Conclusion:** Nurses' knowledge of hepatitis B was very good. And more than half of the nurses had a negative attitude towards hepatitis B prevention. In terms of vaccination more than three-fourth of them started and completed three doses of hepatitis B vaccination.

**Keywords:** attitude; hepatitis b; knowledge; vaccination; tamale; ghana

## Introduction

Chronic hepatitis B infection has over the years increased the cases of liver cirrhosis and hepatocellular carcinoma. According to the World Health Organization 2017 report on hepatitis B, there are close to 257 million people who are infected with chronic hepatitis B globally [1]. Low-income countries are overburden with hepatitis B infection accompanied by its progression to the problems of liver cirrhosis and hepatocellular carcinoma [2].

Many epidemiological studies have indicated varying states of hepatitis B endemicity globally and areas with higher endemicity are located in Sub-Saharan Africa and East Asia where the adult population of 5 and 10% are chronically infected as compared to areas in western and North America where less than 1% of the population is chronically infected [3]. In sub-Saharan Africa, hepatitis B is an endemic problem, it accounts for 87890 deaths every year, and 80% of all cases of hepatocellular carcinoma recorded.[4] In Ghana, the prevalence of chronic hepatitis B virus infection is high ( $\geq 8\%$ ) among the general population, and 11% among pregnant women and in blood donors, and Northern Region is 13.1% [5].

In our healthcare setting transmission of hepatitis B is a big challenge to handle for both patients and healthcare providers especially those in frequent contact with blood. And factors implicated in this situation include knowledge, attitude, and practice of prevention of infection including vaccination. In India, a study among medical students showed that knowledge and attitude of medical students were good towards hepatitis B vaccination but their practice was not sufficient as less than 33% of the students were not unvaccinated [6]. In another similar study in Bangladesh among nurses indicated adequate knowledge of hepatitis vaccination among 67.3% of the respondents but less (49.3%) good hepatitis vaccination practice [7].

Somewhere in Africa, a study in Ethiopia indicated more than 80.0% of respondents had an adequate knowledge positive attitude towards hepatitis B prevention but only 5 (2.0%) of students had completed the three doses schedule of hepatitis B vaccination [8]. In another study in Ghana revealed a prevalence of hepatitis B vaccination uptake to be 53.4% among healthcare workers [9].

A study by Ibrahim on the prevalence of hepatitis b virus infection among health care workers in Tamale revealed the prevalence of hepatitis B to be 26.3% among the healthcare workers and this was higher as compared to the prevalence of 14.5% for the comparison group (non-healthcare workers) in the study [10]. This is not good considering the current means of dealing with this occupational hazard is effective immunization of all healthcare providers that includes nurses with available vaccines which is efficient and safe, hence this study on nurses was to ascertain their knowledge, attitude, and practice (vaccination) of hepatitis B vaccination since they form one of the central healthcare workers who are at greater risk of contracting the hepatitis B virus and are also an important stakeholder in public education on prevention of hepatitis B.

## Method and materials

A descriptive Cross-sectional survey was adopted for this study among nurses of Tamale Central Hospital (TCH). Health care providers especially nurses in developing nations are at severe risk for infection from blood-borne pathogens particularly hepatitis B virus (HBV) — because of the high prevalence in these regions.

## Sample Size Determination

The sample size was calculated using the Yamane formula for calculating sample size which is stated below; where n is the sample size, N is the population size, and e is the level of precision.  $N = 415$ ,  $e = 0.05$ .

$$n = \frac{N}{1 + N(e)^2} \quad n = \frac{415}{1 + 415(0.05)^2} = 204$$

The total sample size will be 204 plus 5% (10) for non-response, hence 214. Stratified and simple random sampling techniques were used for selecting study participants, (RGN = 73, RM = 44, and EN = 97).

## Data collection tool and procedure

A self-administrable structured questionnaire was used to collect data from the study group. The questionnaire was a design taken guide CDC, WHO, and MOH Ghana guidelines on the prevention of hepatitis in the healthcare setting. Questions were divided into four sections: demography, knowledge on hepatitis B, attitude toward hepatitis B prevention, and practice of hepatitis vaccination.

The study questionnaire was piloted to identify areas that needed to be corrected to make the necessary changes before going to the study area for the data collection. Thus; corrections were made before administering the questionnaire in the study area. Final data collection was done by the researcher and assistance from two trained research assistants from the duration of 14<sup>th</sup> February 2020 to 13<sup>th</sup> July 2020.

## Method of data analysis

Data entry and analysis was done using SPSS version 20 (IBM Corp., 2011 and NY). Responses to categorical variables were coded to allow

for quantitative analysis. Data cleaning was done to ensure data accurateness and to maintain the good validity of the study. The continuous variable like age was presented as means with standard deviation. Categorical variables like vaccination status were presented as proportion. Graphs and tables were used to present the study data. Bivariate analysis for the association was done using Chi-square.

Respondents' responses to questions on knowledge and attitude of hepatitis B were scored. Individual total scores were transformed into percentages for classification into knowledge and attitude levels. Those with a score of 60.0% and above were classified to have a Positive attitude level and those with scores below 60.0% were classified as negative attitude level. For knowledge score below 60% was for poor, 60% - 79% for moderate, and 80% and above for high knowledge level on hepatitis B.

## Inclusion and exclusion criteria

All nurses working in Tamale Central Hospital were in the inclusion criteria. And those in the exclusion criteria were nurses who were not randomly selected, those who denied consent to participate in this study, and all those who have worked less than one month in the hospital.

## Quality Control

Data collected in the field was double-checked to guarantee that, all the information required was captured and recorded. In circumstances where a questionnaire was not correctly filled, it had to be re-administered on the respondent by tracing the participant through his or her phone number. Data security was maintained by entering the data on a personal computer with a password. To ensure the quality of data entered, another person was made to separately recheck each entry.

## Ethical consideration

Respondents' consent was gained to answer the questionnaire, the information provided was treated with confidentiality. Any form of physical or psychological harm towards respondents' was avoided. All sources for information used in this research were duly acknowledged to avoid any form of plagiarism.

## Results

### Demographic characteristics

The survey questionnaires that were sent out about 198 out of 214 questionnaires were successfully filled and returned. The mean age of the respondents was 30.6 ±4.6 years, with minimum and maximum ages of 18 and 57 years respectively. The modal age was 30.0 years. About 72.2% of the respondents were married, with the majority (82.8%) of the respondent resides in urban areas. About 43.9% of the respondents have enrolled nurses (EN), 35.4% were registered general nurses (RGN) and 20.7% were registered midwives (RM). With years of work experience, most (63.1%) of them had worked for 6 years and above (**Table: 1**).

		Frequency (n = 198)	Percentage
Age group	29 years and below	65	32.8%
	30 - 39 years	125	63.1%
	40 years and above	8	4.0%
Sex	Male	97	49.0%
	Female	101	51.0%
Religion	Islam	148	74.7%
	Christianity	50	25.3%

Marital Status	Married	143	72.2%
	Single	55	27.8%
Residence address	Urban	164	82.8%
	Peri-Urban	7	3.5%
	Rural	27	13.6%
Highest educational level	Basic certificate	70	35.4%
	Diploma	71	35.9%
	Post diploma	17	8.6%
	Degree	40	20.2%
Nursing category	Registered general nurse	70	35.4%
	Registered midwife	41	20.7%
	Enrolled nurse	87	43.9%
Duration of nursing practice	5 years and less	73	36.9%
	6 years and more	125	63.1%

Source: field survey, 2020.

**Table 1:** Demographic characteristics of respondents

### Respondents' knowledge of hepatitis B

The majority (92.4%) of the respondents knew that hepatitis B is caused by a virus and only a few of the respondents indicated that hepatitis B can

be caused by bacteria (5.6%) and fungi (5.1%). On the transmission of hepatitis B, most of the respondents indicated that it can be transmitted through: sexual intercourse (79.8%), blood transfusion (93.9%), and childbirth (83.8%) (**Table: 2**).

		Frequency (n = 198)	Percentage
<b>Causes of Hepatitis B infection</b>			
Bacteria is a cause of Hepatitis B infection	Yes	11	5.6%
	No	187	94.4%
The virus is the cause of Hepatitis B infection	Yes	183	92.4%
	No	10	5.1%
	Don't know	5	2.5%
Fungi is the cause of Hepatitis B infection	Yes	1	0.5%
	No	188	94.9%
	Don't know	9	4.5%
<b>Transmission routes</b>			
Sexual intercourse is a transmission route for HBV	Yes	158	79.8%
	No	39	19.7%
	Don't know	1	0.5%
Blood transfusion is a transmission route for HBV	Yes	186	93.9%
	No	10	5.1%
	Don't know	2	1.0%
Air is a transmission route of HBV	Yes	16	8.1%
	No	173	87.4%
	Don't know	9	4.5%

Faeco-oral is a transmission route of HBV	Yes	55	27.8%
	No	131	66.2%
	Don't know	12	6.1%
Childbirth is a transmission route of HBV	Yes	166	83.8%
	No	31	15.7%
	Don't know	1	0.5%
Holding hands is a transmission route of HBV	Yes	31	15.7%
	No	148	74.7%
	Don't know	19	9.6%

Source: field survey, 2020

**Table 2:** Respondents knowledge of hepatitis B

The majority of the respondents indicated that hepatitis B does not affect the following organs: stomach (77.3%), lungs (85.4%), skin (75.8%), spleen (55.1%), and intestines (78.7%). On prevention majority (99.0%) indicated that hepatitis B is preventable by vaccination and just about

56.1% knew that there was post-prophylaxis medication for hepatitis B. Also, 91.9% knew that hepatitis B is preventable by Standard precaution practices (**Table: 3**).

Type of organ affected		Frequency (n = 198)	Percentage
HBV affects the stomach	Yes	36	18.2%
	No	153	77.3%
	Don't know	9	4.5%
HBV affects the lungs	Yes	26	13.1%
	No	169	85.4%
	Don't know	3	1.5%
HBV affects the liver	Yes	197	99.5%
	No	1	0.5%
HBV affects the skin	Yes	39	19.7%
	No	150	75.8%
	Don't know	9	4.5%
HBV affects the spleen	Yes	68	34.3%
	No	109	55.1%
	Don't know	21	10.6%
HBV affects the intestines	Yes	29	14.7%
	No	155	78.7%
	Don't know	13	6.6%
<b>Prevention of infection</b>			
Hepatitis B is preventable with vaccination	Yes	196	99.0%
	No	2	1.0%
Hepatitis B has post-exposure prophylaxis	Yes	111	56.1%
	No	37	18.7%

	Don't know	50	25.3%
Hepatitis B is preventable by Standard precaution practices	Yes	182	91.9%
	No	10	5.1%
	Don't know	6	3.0%

Source: field survey, 2020

**Table 3:** Respondents knowledge of hepatitis B

### Respondents' hepatitis B knowledge level

Majority (59.6%) of the respondents had high knowledge on hepatitis B, 36.4% had moderate knowledge and 4.0% had low knowledge hepatitis B. Chi-square analysis showed statistically significant relation between hepatitis knowledge level and the following factor: age  $X^2(4, 198) =$

17.789,  $P = 0.001$ , sex,  $X^2(2, 198) = 13.203$ ,  $P = 0.001$ , educational level,  $X^2(6, 198) = 17.552$ ,  $P = 0.007$ , nursing category,  $X^2(4, 198) = 19.226$ ,  $P = 0.001$  and duration of nursing practice  $X^2(2, 198) = 19.492$ ,  $P \leq 0.001$ . However, the remaining factors were not statistically significant ( $P > 0.05$ ) (**Table 4**).

		Hepatitis B knowledge level			$X^2$	df	P-value
		High	Moderate	Low			
Age group	29 years and below	34	23	8	<b>17.786</b>	<b>4</b>	<b>.001</b>
	30 - 39 years	78	47	0			
	40 years and above	6	2	0			
Sex	Male	69	23	5	<b>13.203</b>	<b>2</b>	<b>.001</b>
	Female	49	49	3			
Religion	Islam	91	52	5	1.23	2	.541
	Christianity	27	20	3			
Marital Status	Married	79	59	5	5.405	2	.067
	Single	39	13	3			
Residence address	Urban	96	60	8	2.075	4	.722
	Peri-Urban	4	3	0			
	Rural	18	9	0			
Highest educational level	Basic certificate	40	25	5	<b>17.552</b>	<b>6</b>	<b>.007</b>
	Diploma	33	35	3			
	Post diploma	15	2	0			
	Degree	30	10	0			
Nursing category	Registered general nurse	49	19	2	<b>19.225</b>	<b>4</b>	<b>.001</b>
	Registered midwife	15	26	0			
	Enrolled nurse	54	27	6			
Duration of nursing practice	5 years and less	33	32	8	<b>19.492</b>	<b>2</b>	<b>.000</b>
	6 years and more	85	40	0			

Source: field survey, 2020

**Table 4:** Chi-square relationship between hepatitis knowledge level respondents socio-demographic factors

### Respondent's attitude towards hepatitis B prevention

More than half (56.1%) of the respondents were concern about being infected with hepatitis B. Majority (94.4%) of the respondents had a positive attitude towards hepatitis B vaccination. Most (87.9%) of the respondents disagreed that Changing damaged gloves during blood collection is a waste of time. About half (50.5%) of the respondents were

of the view that all patients should be tested for hepatitis before they are allowed for healthcare and meanwhile, 68.2% disagreed that they are not comfortable taking care of people infected with hepatitis B. Most (90.9%) were willing to test for hepatitis B, 53.0% had Self-perceived risk of hepatitis B and 85.9% of them believed following infection control guidelines will protect them from hepatitis B (**Table 5**).

		Frequency (n =198)	Percentage
I have a concern about being infected with HBV	Agree	111	56.1%
	Neutral	24	12.1%
	Disagree	63	31.8%
Hepatitis B vaccine is safe and effective	Agree	187	94.4%
	Neutral	3	1.5%

	Disagree	8	4.0%
Changing damaged gloves during blood collection is a waste of time	Agree	19	9.6%
	Neutral	5	2.5%
	Disagree	174	87.9%
All patients should be tested for hepatitis B before they receive health care	Agree	100	50.5%
	Neutral	23	11.6%
	Disagree	75	37.9%
I do not feel comfortable to take care of people infected with hepatitis B	Agree	48	24.2%
	Neutral	15	7.6%
	Disagree	135	68.2%
Following infection control guidelines will protect me from being infected with hepatitis B at work?	Agree	170	85.9%
	Neutral	12	6.1%
	Disagree	16	8.1%
Willing to test for hepatitis B	Agree	180	90.9%
	Neutral	5	2.5%
	Disagree	13	6.6%
Self-perceived risk of hepatitis B	Agree	105	53.0%
	Neutral	60	30.3%
	Disagree	33	16.7%

Source: field survey, 2020

**Table 5:** Respondents attitude toward hepatitis B prevention

**Respondents’ hepatitis B hepatitis attitude level**

About 42.9% had positive attitude toward hepatitis B prevention and 57.1% had negative attitude. Chi-square analysis showed significant relationship between respondents’ attitude level towards hepatitis B and

the following factors: marital status  $X^2(1, 198) = 11.090, P = 0.001$ , residential address  $X^2(2, 198) = 11.411, P = 0.003$  and duration of nursing practice  $X^2(1, 198) = 4.769, P = 0.029$ . However, the remaining factors were not statistically significant ( $P > 0.05$ ) (**Table 6**).

		Attitude toward hepatitis B prevention		$X^2$	df	P-value
		Positive attitude	Negative attitude			
Age group	29 years and below	22	43	4.054	2	.132
	30 - 39 years	58	67			
	40 years and above	5	3			
Sex	Male	37	60	1.777	1	.183
	Female	48	53			
Religion	Islam	62	86	.257	1	.612
	Christianity	23	27			
Marital Status	Married	51	92	11.09	1	.001
	Single	34	21			
Residence address	Urban	62	102	11.411	2	.003
	Peri-Urban	6	1			
	Rural	17	10			
Highest educational level	Basic certificate	33	37	1.233	3	.745
	Diploma	29	42			



Nursing category	Post diploma	8	9			
	Degree	15	25			
	Registered general nurse	27	43	1.813	2	.404
	Registered midwife	16	25			
Duration of nursing practice	Enrolled nurse	42	45			
	5 years and less	24	49	<b>4.769</b>	<b>1</b>	<b>.029</b>
	6 years and more	61	64			

Source: field survey, 2020

**Table 6:** Chi-square relationship between hepatitis attitude level respondents socio-demographic factors

### Respondent hepatitis B vaccination status

The prevalence of completed (at least three doses) hepatitis B vaccination among the respondents was 77.3%, while 2.5% had received only one dose of vaccination, 5.1% had received two doses and 15.2% had none dose of vaccination. This means 84.8% (168/198) of nurses started vaccination against hepatitis B. It is, however, noteworthy that only 77.3% of the respondents started completed at least three doses of the vaccination. The only factor with a statistically significant relationship with vaccination completeness status was respondent marital status  $\chi^2(1, 198) = 8.063, P = 0.005$ , vaccination completeness was proportionally higher among those married as compared to those who were single.

### Discussion

The most frequent age in this study was 30 years, which is reflective of the working population in Ghana [11]. The majority of the respondents knew that hepatitis B is caused by a virus and only a few of the respondents indicated that hepatitis B can be caused by bacteria and fungi. The implication of this is that most of the nurses are on point on the causes of hepatitis B because hepatitis B is a viral infection and not caused by bacteria, fungi, or worms [12]. From the literature, the common routes of hepatitis B infection include unprotected sex, mother to child during childbirth, and as well as contact with blood or body fluid of infected person and most of the study respondents knew this [12]. On prevention, the majority indicated that hepatitis B is preventable by vaccination and just about 56.1% knew that there was post-prophylaxis medication for hepatitis B. Also, 91.9% knew that hepatitis B is preventable by Standard precaution practices. According to the world health organization best prevention of hepatitis B is by vaccination and this is safe for all categories of people [12]. There are preventive actions which can be taken by health care workers to prevent and reduce hospital-acquired infections, which include adhering to standard precautions and vaccination against the disease such as hepatitis B [13, 14].

The majority (59.6%) of the respondents had high knowledge of hepatitis B, 36.4% had moderate knowledge and 4.0% had low knowledge of hepatitis B. This study result is good when compared with a study, which revealed only adequate (67.3%) knowledge and preventive practices regarding hepatitis B among nurses [7]. This is still a better result when compared with a study discloses that 43.8% of healthcare workers had poor knowledge [15].

Study analysis showed a statistically significant relationship between the hepatitis knowledge level and the following factor: age, sex, educational level, nursing category, and duration of nursing practice. This result was reinforced in another study conducted in public hospitals in White Nile State; it revealed no affiliation between age, sex, marital status, and hepatitis B knowledge of health care workers [17]. Meanwhile, a study by Hassan et al. indicated that there was no significant relation between good knowledge of Hepatitis infection and socio-demographic characteristics such as age, sex, duration of service, marital status, and religion [16].

More than half of the respondents were concern about being infected with hepatitis B. This is not good because all must be concern about getting infected irrespective of vaccination status, since vaccination is for

hepatitis B alone, and there are other related infectious diseases. According to the Ministry of Health Ghana (MOH), gloves are to be changed immediately when damage during procedures and proper hand hygiene performed and this was the view of most of the respondents [14].

About 42.9% had a positive attitude toward hepatitis B prevention and 57.1% had a negative attitude. This study finding is very low when compared with a similar study which reported that a great majority of the respondents (86.4%) with a favorable attitude towards the preventive measures of HBV infection [18]. Also, a study in Bantama Ghana revealed that out of the 175 respondents, 2.28-25.13% were within the negative attitude range while 69.14- 91.9% presented a positive attitude towards HBV however 4.57-5.7% were unaware of the issues [19].

This current study showed a significant relationship between respondents' attitude level towards hepatitis B and the following factors: marital status, residential address, and duration of nursing practice. In Mursy and Mohamed's study, there was no significant relationship between attitude level and socio-demographic factors such as duration of work, age, etc [18]. Also, a study result in Ghana revealed no significant relationship between attitude and respondents' demographic characteristics [19].

Hepatitis B vaccine is 95% effective in preventing HBV infection and its chronic consequences [12]. The prevalence of completed (at least three doses) hepatitis B vaccination among the respondents was 77.3%, while 2.5% had received only one dose of vaccination, 5.1% had received two doses and 15.2% had none dose of vaccination. This means 84.8% (168/198) of nurses started vaccination against hepatitis B. It is, however, noteworthy that only 77.3% of the respondents started and completed three doses of the vaccination. This study finding is better as compared to several studies worldwide which indicated low hepatitis B vaccination coverage among health care workers [7, 17, 20, 21, 22]. In a Ghana study, 66.8% of respondents have been vaccinated and 49.4% of those vaccinated stated the vaccination concluded the full dose of the vaccination [21].

The study revealed a statistically significant relationship between vaccination completeness status and respondent marital status. Vaccination completeness was proportionally higher among those married as compared to those who were single. In a similar study marital status determines the vaccination status of HCWs [23].

This study is not without limitation as all factors related to hepatitis B vaccination compliance were not all explored.

### Conclusion

The nurses' knowledge level on hepatitis B was very good but less than half the nurses had a positive attitude towards hepatitis B prevention. In terms of vaccination more than three-fourth of them started and completed three doses of hepatitis B vaccination. Good knowledge is not enough for first against hepatitis B infection in our health facilities and our communities. This study highlights the urgent need to improve HBV infection and approaches that warrant that nurses and other healthcare workers are screened and fully vaccinated against the infection to prevent potential future exposure to the virus.

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