Original Article

Health Workers' Knowledge, Attitude and Practice towards Hepatitis B Infection in Northern Nigeria

Fufore Mohammed Bello, MBBS, MSc in Public Health
Department of ORL, Federal Medical Centre, Yola, Adamawa State, Nigeria.

Cook Penny Anne, BSc. (Hons), PhD, FRSPH
Professor of Epidemiology & Statistics, School of Health Sciences, University of Salford, Manchester, United Kingdom

Kirfi Abdullahi Musa, MBBS
Department of ORL, Abubakar Tafawa Balewa Teaching Hospital, Bauchi, PMB 0117, Bauchi State, Nigeria.

Correspondence: Mohammed Bello Fufore, Department of ORL, Federal Medical Centre, Yola, PMB 2017, Adamawa State, Nigeria. E-mail address: drbellofufore@yahoo.com

Abstract

Background: Infection by hepatitis B virus is one of the many challenges in public health today and the tenth leading cause of mortality worldwide. Research has shown that health-care personnel are at higher risk of acquiring the disease than the general population.
Aim: The aim of this study was to investigate the relationship between knowledge, attitude and practice among health workers towards hepatitis B infection in Northern Nigeria.
Methods: This study used a cross-sectional survey with self-administered questionnaire to gather information from an Ear, Nose and Throat health-care professionals in a tertiary hospital in Northern Nigeria. The data collected was coded and analyzed using SPSS software version 20.
Results: A similar numbers of males, 49.5% (53/107), and females, 50.5% (54/107) took part. The overall correctly answered knowledge questions by the professions was 76.9%. A one-way ANOVA between participants showed that there were significant difference between the profession groups in terms of knowledge scores ($F_{4, 102} = 11.5$, $P < 0.001$) and in terms of practice scores between the groups ($F_{4, 102} = 4.1$, $P < 0.01$); however, there was no significant difference in attitude between the professional groups ($F_{4, 102} = 0.6$, $P = 0.68$). Multivariate analysis showed that health attendants had the best practice score and did not differ significantly to Doctors ($\beta = -0.1$, $t = -0.9$, $P = 0.40$).
Conclusion: The findings suggest that there is a gap in knowledge and lack of compliance to infection control and preventive measures among health-care professionals. There should be an increased in awareness through campaigns geared towards educating health-care personnel on the dangers of hepatitis B infection.

Keywords: Health care workers, Hepatitis B infection, prevention and control, Knowledge, attitude and practice, Developing countries

Introduction

Hepatitis B (HB) infection is a major public health problem globally (Kumar et al., 2010; Oyewusi, Okanlawon & Ndikom, 2015). It is the tenth leading cause of mortality worldwide (Kumar et al., 2010; Al-Hazmi, 2015) and one of the most important infectious diseases, especially in developing countries (Abeje & Azage, 2015; Al-Hazmi, 2015). Like HIV, HB is a blood borne infection, but it is about 50−100 times more infectious than HIV (Centers for Disease Control and Prevention [CDC], 2012). HB infection is the most common cause of chronic liver disease globally (CDC, 2012; Al-Hazmi, 2015) accounting for 80% of all liver cancer mortalities worldwide (CDC, 2006). It is the second most significant human carcinogen after tobacco (Lee et al., 2009; Juon & Park, 2013; Al-Hazmi, 2015).

The hepatitis B virus (HBV) is estimated to have infected more than two-billion people worldwide, and about 360−400 million people are chronically infected (Ogoina et al., 2014; Abeje & Azage, 2015; Al-Hazmi, 2015).

The annual mortality due to HB infection is estimated to be between 0.61 million and one million (Ul Haq et al., 2013; Abeje & Azage, 2015; Oyewusi, Okanlawon & Ndikom, 2015) and every year, 4.5 million new cases are recorded worldwide (Forbi et al., 2010).

Seventy-five to ninety percent of cases of chronic HB carriers are from African and Asian origins (Mbaisi et al., 2013; Ogoina et al., 2014; Adekanle et al., 2015). The prevalence of HBV varies across the globe, particularly in developing countries: it ranges between 2.1% and 7.0% in Ethiopia (Abeje & Azage, 2015), 5%−30% in Kenya (Makori Mbakaya & Karanja, 2014), 6%−30% in Bangladesh (Mehriban Ahsan & Islam, 2015) and 10%−40% in Nigeria (Samuel et al., 2009; Eke et al., 2011; Ogoina et al., 2014).

HBV is transmitted through blood and blood products, body fluids, sharps, sexual intercourse and through vertical transmission (Nazzal & Sobuh, 2014; Al-Hazmi, 2015).

Health-care workers (HCWs) are at a higher risk of contracting the virus because of their exposure to sharps, blood and body fluids (Abeje & Azage, 2015; Al-Hazmi, 2015).

The prevalence of HB is increasing in the developing countries, including Nigeria, while HB preventive measures are not practiced by many HCWs (Abeje & Azage, 2015; Oyewusi, Okanlawon & Ndikom, 2015).

Knowledge, attitude and practice (KAP) by HCWs towards HB infection is generally inadequate in most of the developing countries (Samuel et al., 2009; Adekanle et al., 2015). There are very few studies conducted on health professionals in Nigeria that assess their KAP towards HB infection (Kesieme et al., 2011). The studies that have been carried out have mostly focused on medical students and dentists; most, if not all, of the studies were from the Southern part of the country, and none of these available studies appear to have been carried out upon ENT health professionals.

The aim of this study is to investigate the relationship between KAP among HCWs towards HB infection in Northern Nigeria and the objectives are to 1) to determine the level of KAP of HCWs regarding HB infection and its transmission and prevention; 2) to compare the level of KAP between different groups of health professionals and 3) to assess the relationships between knowledge, attitude and practice.

Research questions

What do the health workers know about HB infection and its preventive measures?

How is hepatitis B infection prevented by the health workers?

Research hypothesis

Knowledge on hepatitis B infection will be positively associated with good practice of hepatitis B preventive measures by the health care professionals.

There would be no relationship between professional education and knowledge, attitude/practice of HB preventive measures.

Methods

A descriptive cross-sectional survey that utilized a self-administered questionnaire was adapted for this study to gather relevant information from participants.

This study was conducted on an ENT health professionals in a hospital that was located in the

Northern part of Nigeria. Ethical approval for the study was obtained from the hospital ethics committee and the University of Salford (ref: 1415-126 Fufore).

Verbal consent was sought and obtained from the participants and a statement confirming that participants had understood the "participant information sheet" and consented to the study was included as a tick box on the questionnaire. Participants were required to have at least six months of working experience, be aged between 18 and 65 years and were required to be clinical staff. Visiting consultants and student nurses were excluded.

Sample size calculation

The formula for calculating sample size was N>50+8m (Dancey, Reidy & Rowe, 2012).

Where N = number of participants m = number of independent variables (IVs)

There are six variables for this study: four dummy variables for profession (i.e, doctors, nurses, pharmacists and laboratory scientists) plus attitude and knowledge, therefore the study required at least 99 participants (N>98).

There were 212 eligible participants but there were only 127 participants available to invite (i.e. those who were available on the site during the questionnaire-distribution period). Since this was close to the target number (99), we decided to invite all available participants. All the participants were given the chance to take part in the study.

The data for the study were collected using self-administered questionnaires with 45 items on demography, knowledge, attitude and practice that were chosen from available questions validated in previous studies (Samuel et al., 2009; Alkandari et al., 2013; Abeje & Azage, 2015; Adekanle et al., 2015; Al-Hazmi, 2015; Oyewusi, Okanlawon & Ndikom, 2015). The data collection was conducted over a period of three weeks (from 22 June, 2015 to 13 July, 2015).

The data from completed questionnaires were coded and analyzed using SPSS software version 20. Using a five-point Likert-scale, from strongly agree to strongly disagree. Responses that included "agree" and "strongly agree" were collapsed into the response category "agree" and was coded 1 if its correct answer, else coded 0.

Likewise, responses of "disagree" or "strongly disagree" were also collapsed into the response category "disagree" and was coded 1 if it's correct answer and else coded 0. Again, for responses with "yes", "no" and "don't know"; correct answers to positively worded statements were coded 1, else were coded 0.

Correct answers were added to give total knowledge, attitude and practice scores.

Descriptive statistics were used to determine the distributions and frequencies of the variables. KAP variables were approximately normally distributed and were therefore analyzed using Pearson's correlation coefficient. Analysis of variance was employed to compare the means of the KAP total scores between professions.

Multiple linear regression was used to predict good practice from: knowledge, attitude and professional group. Professional group was entered in the analysis as series of dummy variables (doctor, pharmacist, laboratory scientist, nurse, with attendants as the reference category).

Results

Response rate and demographics characteristics

Of the 127 potential participants who were contacted, 108 responded (response rate=85.0%). One questionnaire was excluded from the analysis due to incomplete response. Of the remaining 107 respondents, there were similar numbers of males, 49.5% (53/107), and females, 50.5% (54/107). Nurses, attendants and doctors made up the majority of the respondents surveyed accounting for 81.3% (87/107).

The majority of the participants 73.6% (78/106) were within the age group of 26−41 years. Most, 80.4% (86/107), of the respondents had less than 10 years of working experience.

Table 1 shows detailed demographic characteristics of the respondents. About 58.0% (62/107) of the respondents had a degree and higher qualification while 16.8% (18/107) had up to secondary school education (see figure 1).

Knowledge, attitude and practice questions

Table 2 gives details of the knowledge questions and the percentage getting the correct answer, broken down by profession.

Of the 22 knowledge questions, doctors achieved the highest number of correct results on average (91.5%), followed by laboratory scientists (81.5%), nurses (74.6%), pharmacists (69.5%) and attendants (67.3%).

More than 90.0% of the doctors, nurses and attendants agreed that HBV is about 50−100 times more infectious than HIV but only 42.9% of the pharmacists subscribed to that. On average, only 46.0% of the respondents correctly identified that HB cannot be transmitted faeco-orally. More than 15.0% of the attendants did not know that HB is cause by a virus.

Table 3 gives details of the attitude questions and the positive attitude responses by profession.

More than 84.0% of the nurses and attendants felt they were at risk of HB infection by virtue of their work. The majority of the HCWs felt they need to be protected from HB infection and most knew their HB status. About 85.0% of the HCWs considered it necessary to receive HB vaccine.

The majority of the respondents had received HB vaccine but fewer than 30.0% had completed the vaccination schedule. Figure 2 shows reasons given for not being vaccinated.

Table 4 gives details of the practice questions and the percentage of respondents with good practice responses by professions. On average, 76.7% of the HCWs stated that they wore gloves when carrying out a procedure on patients.

Only 15.2% of the respondents wear glasses when carrying out procedures on patients. More than 97.1% of the participants claimed to be disposing of sharps properly after a procedure.

Knowledge, attitude and practice scores

In table 5, the overall mean knowledge score for all the professions was 17.0 (95% CI = 16.32−17.68).

By profession, doctors showed an excellent knowledge of HB infection with a mean score of 20.1 (95% CI = 19.35−20.89) out of a possible 22 while attendants had the lowest score with mean score of 14.8 (95% CI = 13.23−16.39).

A one-way ANOVA between participants showed that there were significant differences between the profession groups in terms of knowledge scores ($F_{4, 102} = 11.48$, $P = 0.0001$).

A post-hoc test (LSD) showed that doctors had significantly higher knowledge than all the other professions ($P < 0.001$), while there were no significant differences between nurses and pharmacist ($P = 0.363$), nurses and laboratory scientist ($P = 0.123$), pharmacist and laboratory scientist ($P = 0.063$) and pharmacist and attendants ($P = 0.709$).

The mean score for positive attitude from table 5 showed that attendants had the lowest mean score of 8.7 (CI = 7.74−9.72) out of a total possible score of 13. There was no significant difference in attitude between the professional groups ($F_{4, 102} = 0.58$, $p = 0.676$).The maximum score for good practice was 4 and attendants had a highest score for good practice than the other health professionals with a mean score of 2.9 (CI = 2.58−3.26) while the lowest score was among the pharmacists with a mean of 1.7 (CI = 1.02−2.41).

A one-way ANOVA showed that there was significant difference between the professional groups in terms of practice scores ($F_{4, 102} = 4.10$, $P = 0.004$).

The post-hoc LSD test showed that attendants had significantly higher practice score than the nurses ($P = 0.009$), pharmacist ($P = 0.001$) and laboratory scientist ($P = 0.028$). However, there was no significant difference between doctors and attendants ($P = 0.290$).

Table 6 shows the correlation coefficients between knowledge, attitude and practice and reveals that the attitude score and knowledge score showed a moderately positive relationship which was statistically significant. Also, the total attitude score and total practice score showed weak positive relationship which was also statistically significant. However, there was no relationship between total practice score and total knowledge score.

Multiple regression analysis

Multiple regression analysis showed that the six variables (total knowledge score, total attitude score, and the dummy variables for role: nurses, doctors, pharmacist, laboratory scientist), taken

together, were significant predictors of total practice score ($F_{6, 100} = 4.01$, P = 0.001).

The variables that contributed most to the prediction of the total practice score were the total attitude score (β = 0.25, t = 2.62, p = 0.01), and the roles of nurse (β = −0.309, t = −2.680, p = 0.009), pharmacist (β = −0.353, t = −3.604, p = <0.001) and laboratory scientist (β = −0.222, t = −2.061, p = 0.042).

Attendants (the reference category) had the highest score for practice and did not differ significantly to doctors (β = −0.110, t = −0.850, p = 0.397). The analysis revealed the multiple R to be 0.44, with the six variables accounting for 15% (adjusted $R^2 = 0.15$) of the variance in total practice score.

Discussion

Hepatitis B infection is one of the major health problems worldwide casting a major source of misery to those infected and an enormous burden on the health care system (Mehriban, Ahsan & Islam, 2015; Oyewusi, Okanlawon & Ndikom, 2015).

HBV is an important cause of liver cancer and liver cirrhosis and is likely to persist as an important health issue resulting in substantial mortality and morbidity for many years to come, particularly in developing countries (Abdul-Mujeeb, 1997).

Knowledge of HB infection

Results of this study shows that, on average, doctors answered correctly 91.5% of the knowledge questions regarding HB infection followed by laboratory scientists (81.5%), nurses (74.6%), pharmacists (69.5%) and attendants (67.3%).

As a whole, respondents were correct for 76.7% of all knowledge questions which was higher than that reported in Ethiopia and Kuwait of 52.0% and 57.7% respectively (Alkandari et al., 2013; Abeje & Azage, 2015). However, the answers to some questions revealed a gap in knowledge. For example, 54.0% of participants were unaware that HBV cannot be transmitted faeco-orally, and 44.3% did not know that

the virus is not transmitted through drinking contaminated water. In addition, 56.5% were unaware that the virus cannot be prevented by avoiding drinking contaminated water, and 36.8% wrongly thought that HBV can be prevented by avoiding food not well cooked.

Although these findings were similar to that reported by Alkandari and colleagues (2013) in Kuwait; however, this percentage is high compared to that reported by Samuel and colleagues (2009) which showed that only 14.2% and 9.3% incorrectly identified faeco-oral route and drinking contaminated water as means of transmitting the virus while 6.2% and 3.1% wrongly thought that HBV can be prevented by avoiding contaminated water and food that is not well cooked.

More than 90.0% of the respondents in this study correctly mentioned that HBV can be transmitted through sharps and contaminated blood, which was similar to other studies from Morocco, Sudan and Nigeria (Djeriri, Laurichesse & Merle, 2008; Bakry et al., 2012; Adekanle et al., 2015); however, up to 21.0% thought that the virus cannot be transmitted through sexual intercourse and about half of the participants did not know that the virus is not transmitted through hugging or handshake.

Although these findings were superior compared to what was reported in Southern Nigeria (Okwara et al., 2012; Adekanle et al., 2015), however, this evidence therefore reveals the existence of a knowledge-gap among the health-care professionals about the mechanism of transmission and prevention of HB infection.

Majority of the respondents knew that the virus can be effectively prevented through vaccination, proper disposal of sharps and avoiding multiple sexual partners. However, 30.0% of the respondents claimed that there is no vaccine available for HBV. This large gap in knowledge should be bridged as a matter of urgency.

Attitude towards hepatitis B infection

In this study 17.6% of the respondents reported that they were not at risk of contracting HB by virtue of their work. Similarly, 16.1% of respondents felt they don't need to be protected from HB infection. Although these findings were similar to other studies from Ethiopia and Bangladesh (Abeje & Azage, 2015; Mehriban, Ahsan & Islam, 2015), but this is unacceptably high considering the fact that all HCWs are expected to know that they are at a higher risk of

contracting HBV. These HCWs are less likely to take HB infection control and prevention measures seriously since they thought they were not at risk of HB infection.

Thirty-six percent of the respondents did not know their HBV status and only 58.0% of the participants had received HB vaccine.

Furthermore, only 29.0% claimed to have completed the vaccination schedule. Similar findings were reported among HCWs in Southern Nigeria (Kesieme et al., 2011; Okwara et al., 2012) while some have reported slightly higher patronage on vaccination by HCWs (Fatusi et al., 2000; Okeke et al., 2008; Adekanle et al., 2015).

This is particularly worrisome considering the fact that the study participants were highly at risk of exposure to HBV due to their occupation, and also Nigeria being one of the countries with high prevalence of HB infection. Similarly, the lack of knowledge among HCWs who may be HB positive and not know their status could potentially put their patients at risk of contracting the disease.

Practice towards hepatitis B preventive measures

The need for the adoption of consistent and appropriate safety precautions by hospital personnel is of paramount importance in view of the high prevalence rate of HBV and

the high frequency of potentially contaminating accidents among hospital workers and also in the general population (Okwara et al., 2012).

This is why practice was the main focus of analysis in this study and all other variables were used to predict practice. Wearing gloves while carrying-out a procedure on patients is one of the most important issue in the guidelines for infection control. In this study only 76.7% of respondents wore gloves when in contact with patients.

Although the results of this study were in consistent with other studies (Alkandari et al., 2013; Mehriban, Ahsan & Islam, 2015); yet, Samuel and colleagues (2009) reported a much higher percentage of 92.6%. However, the glove use behavior in this current study was better than that reported by Bakry and colleagues (2012) in Sudan and Oyewusi and colleagues (2015) in Nigeria.

Only 15.2% and 50.0% of the respondents used glasses and face-mask respectively when carrying out procedures on patients. This finding of used of glasses was in agreement with what Samuel and colleagues (2009) reported in Southern Nigeria.

Although these figures were unacceptably low, the findings were however better compared that reported by Oyewusi and colleagues (2015) in South-Western Nigeria, which showed that none of the respondents used glasses and only 1.9% used face-masks.Ninety-seven percent of the respondents in this study claimed to be disposing of sharps properly after used. This was slightly higher compared to that reported in other studies among HCWs (Samuel et al., 2009; Alkandari et al., 2013).

This current study revealed that knowledge was related to attitude, which in turn was positively related to practice. The findings showed that health attendants had the best practice, despite having the least knowledge. Unlike the other professions, doctors, nurses and the attendants are expected to have good practice because they have a lot of direct contact with each other and direct experience of hands-on care for patients.

However, lack of good practice among these professions calls for concern among stakeholders; this group of health professionals should be better qualified and being role models to health attendants in terms of good practice, and not the other way around.

Strengths and limitations

The strength of this study is that, to our knowledge, it is the first study that was conducted on an ENT health professionals that assessed their KAP towards HB infection. ENT is a high risk environment due to a high vascular supply and secretory glands in the ear, nose and throat, which increases the risk of a health worker coming in contact with blood and secretions, which in turn increases the risk of contracting HBV. Another strength was that the survey used measures that were used in previous surveys and drawn from behavioral theories (that predicts a relationship between knowledge, attitudes and practice) (Champion & Skinner, 2002; Ma et al., 2007), and shown to be reliable

and valid among HCWs in other countries. Furthermore, information obtained from this survey may contribute to scientific knowledge about HBV among HCWs, and also inform future research on this health issue.

Table 1: Respondents' demographic characteristics

Variables	Frequency	Percentage
Age group in years (n=106)		
18 – 25	7	6.5
26 – 33	48	44.9
34 – 41	30	28.0
42 – 49	15	14.0
50 – 57	4	3.7
58 – 65	2	1.9
Gender (n=107)		
Male	53	49.5
Female	54	50.5
Profession (n=107)		
Medical doctor	25	23.4
Nurse	36	33.6
Pharmacist	7	6.5
Lab scientist/tech	13	12.1
Health attendant	26	24.3
Years of practice (n=107)		
6 Months - 10 Years	86	80.4
11 - 20 Years	16	15.0
21 - 30 Years	5	4.7
Highest level of education (n=107)		
Up to secondary school	18	16.8
Diploma	27	25.2
Degree and higher	62	57.9

n = number of participants

Table 2: Percentage of participants with correct responses to knowledge questions by profession

Knowledge questions	Type of profession					
	MD (n=25) % correct	N (n=36)% correct	P (n=7) % correct	LS (n=13)% correct	HA (n=26)% correct	Total (n=107)% correct
HBV is 50 to 100 times more infectious than HIV	100.0	88.9	42.9	69.2	88.5	77.9
Hepatitis B can cause liver cancer	100.0	86.1	85.7	92.3	88.5	90.5
Hepatitis B can cause liver cirrhosis	100.0	83.3	100.0	92.3	80.8	91.2
Hepatitis B can be transmitted through blood and blood products	100.0	94.4	85.7	92.3	80.8	90.6
Hepatitis B can be transmitted through sharps and needles	100.0	91.7	85.7	92.3	80.8	90.1
Hepatitis B can transmitted through sexual intercourse	96.0	77.8	42.9	100.0	76.9	78.7
A HCW can infect patients with hepatitis B infection	96.0	80.6	57.1	84.6	76.9	79.0
Hepatitis B is among the leading cause of death globally	52.0	50.0	57.1	69.2	73.1	60.3
Three doses of HB vaccines are required for full protection	76.0	94.4	71.4	100.0	80.8	84.5
Hepatitis B can be effectively prevented through vaccination	88.0	88.9	100.0	100.0	80.8	91.5
HB can be prevented by proper disposal of sharps and blood	96.0	88.9	100.0	100.0	84.6	93.9
HB can be prevented by avoiding multiple sexual partners	100.0	83.3	85.7	100.0	69.2	87.6
HB can be transmitted through drinking contaminated water	92.0	41.7	57.1	61.5	26.9	55.7
HB can be transmitted by handshake or hugging an infected person	84.0	58.3	42.9	61.5	42.3	57.8
HB can be transmitted faeco-orally	88.0	22.2	42.9	38.5	38.5	46.0
There is no vaccine so far available for HB infection	92.0	80.6	57.1	69.2	50.0	69.9
Vaccine for HB is available but is not effective	88.0	75.0	71.4	76.9	42.3	70.7
HB can be prevented by avoiding drinking contaminated water	84.0	27.8	28.6	46.2	30.8	43.5
HB can be prevented by avoiding food not well cooked	84.0	44.4	57.1	76.9	53.8	63.2
What type of infection is hepatitis B?	100.0	94.4	100.0	92.3	84.6	94.3
Which organ does hepatitis B commonly affect?	96.0	97.2	100.0	92.3	80.8	93.3
The interval between doses of HB vaccines	100.0	91.7	57.1	84.6	69.2	80.5
Average % correct across all questions	91.5	74.6	69.5	81.3	67.3	76.9

n = number of participants, MD = medical doctor, N = nurse, P = pharmacist, LS = lab scientist & HA = health attendant

Table 3: Percentage of participants giving positive responses to attitude questions by profession

Attitude	Profession					
	MD (n=25) % +ve attitude	N (n=36) % +ve attitude	P (n=7)% +ve attitude	LS (n=13) % +ve attitude	HA (n=25) % +ve attitude	Total (n=107)%+ve attitude
Do you feel at risk by virtue of your work?	100.0	83.3	71.4	76.9	84.6	82.4
Do you feel you need to be protected from HB infection?	100.0	88.9	100.0	84.6	96.2	93.9
Do you know your HB status?	72.0	63.9	42.9	92.3	50.0	64.2
Do you considered it necessary to receive HB vaccine?	92.0	88.9	85.7	92.3	84.6	88.7
Will you vaccinate your children against HB?	100.0	94.4	85.7	92.3	88.5	92.2
Will you recommend HB vaccine to other health HCWs?	100.0	91.7	85.7	92.3	96.2	93.2
Have you ever received HB vaccine?	68.0	55.6	85.7	30.8	50.0	58.0
Have you completed HB vaccination schedule?	32.0	30.6	28.6	15.4	38.5	29.0
Does your lifestyle put you at risk of HB infection?	80.0	83.3	85.7	76.9	42.3	73.6
Is HB vaccine safe?	88.0	86.1	71.4	84.6	73.1	80.6
Do take post exposure prophylactic for HB?	8.0	22.2	28.6	53.8	61.5	34.8
Do you avoid patients diagnosed with HB?	96.0	88.9	71.4	100.0	69.2	85.1
How many doses of vaccine have you received?*	36	30.6	57.1	15.4	38.5	35.5
Average % correct across all attitude questions	74.8	69.9	69.2	69.8	67.2	70.2

* proportion with three doses of vaccine n = number of participants, MD = medical doctor, N = nurse, P = pharmacist, LS = lab scientist & HA = health attendant

Table 4: Percentage of participants giving positive responses to practice questions by profession

Practice questions	Profession					
	MD (n=25)% good practice	N (n=36)% good practice	P (n=7)% good practice	LS (n=13)% good practice	HA (n=26)% good practice	Total (n=107)% good practice
Do you wear gloves when carrying out procedures?	92.0	86.1	28.6	84.6	92.3	76.7
Do you wear glasses when carrying out procedures?	12.0	11.1	14.3	7.7	30.8	15.2
Do you wear a facemask when at direct contact with a patient	68.0	41.7	28.6	46.2	69.2	50.7
Do you dispose of sharps properly after a procedure?	96.0	97.2	100.0	92.3	100.0	97.1
Average % correct across all practice questions	67.0	59.0	42.9	57.7	73.1	59.9

n = number of participants, MD = medical doctor, N = nurse, P = pharmacist, LS = lab scientist & HA = health attendant

Table 5: Descriptive statistics for knowledge, attitude, practice (total scores) and professions

				95% Confidence Interval for Mean			
		N	Mean	Lower Bound	Upper Bound	Min	Max
Total knowledge score	Medical doctors	25	20.1	19.35	20.89	14	22
	Nurses	36	16.4	15.43	17.41	8	22
	Pharmacist	7	15.3	12.19	18.39	11	20
	Lab scientist	13	17.9	16.34	19.51	13	21
	Attendants	26	14.8	13.23	16.39	6	21
	Total	107	17.0	16.32	17.68	6	22
Total attitude score	Medical doctors	25	9.7	8.90	10.54	6	12
	Nurses	36	9.1	8.25	9.92	3	13
	Pharmacist	7	9.0	6.18	11.83	3	13
	Lab scientist	13	9.1	7.74	10.42	5	13
	Attendants	26	8.7	7.74	9.72	4	12
	Total	107	9.1	8.69	9.59	3	13
Total practice score	Medical doctors	25	2.7	2.37	2.99	1	4
	Nurses	36	2.4	2.10	2.62	1	4
	Pharmacist	7	1.7	1.02	2.41	1	3
	Lab scientist	13	2.3	1.68	2.93	0	4
	Attendants	26	2.9	2.58	3.26	1	4
	Total	107	2.5	2.36	2.69	0	4

Table 6: Correlation coefficients between knowledge, attitude and practice (n=107)

		Total knowledge score	Total attitude score	Total practice score
Total knowledge score	Pearson Correlation	1	.303✞	-.003
	P		.002	.975
Total attitude score	Pearson Correlation	.303✞	1	.220*
	P	.002		.023
Total practice score	Pearson Correlation	-.003	.220*	1
	P	.975	.023	

* Correlation is significant at the 0.01 level (1-tailed) ✞ Correlation is significant at the 0.01 level (2-tailed) n = number of participants

Figure 1: the distribution of health professionals with their educational qualification

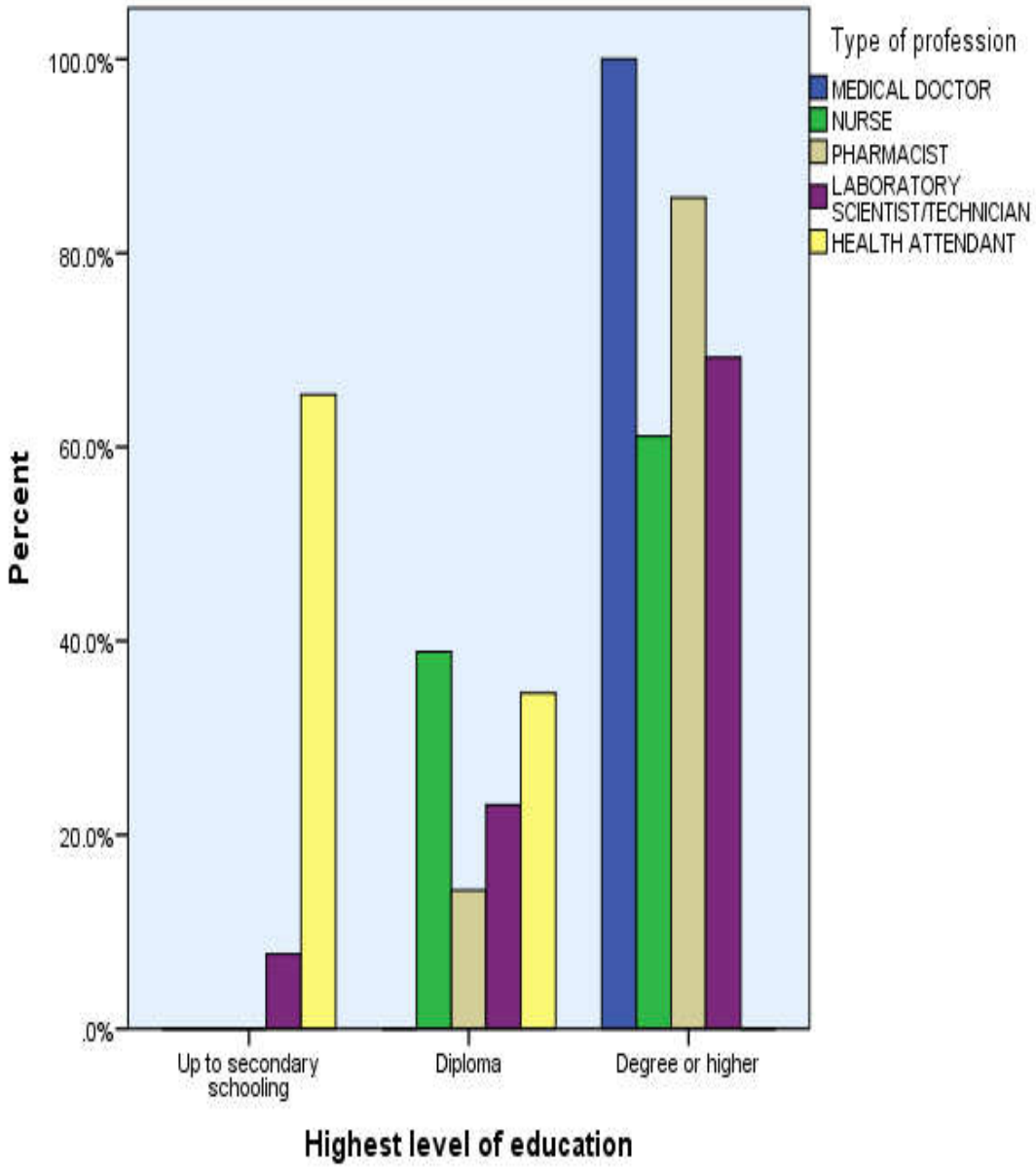
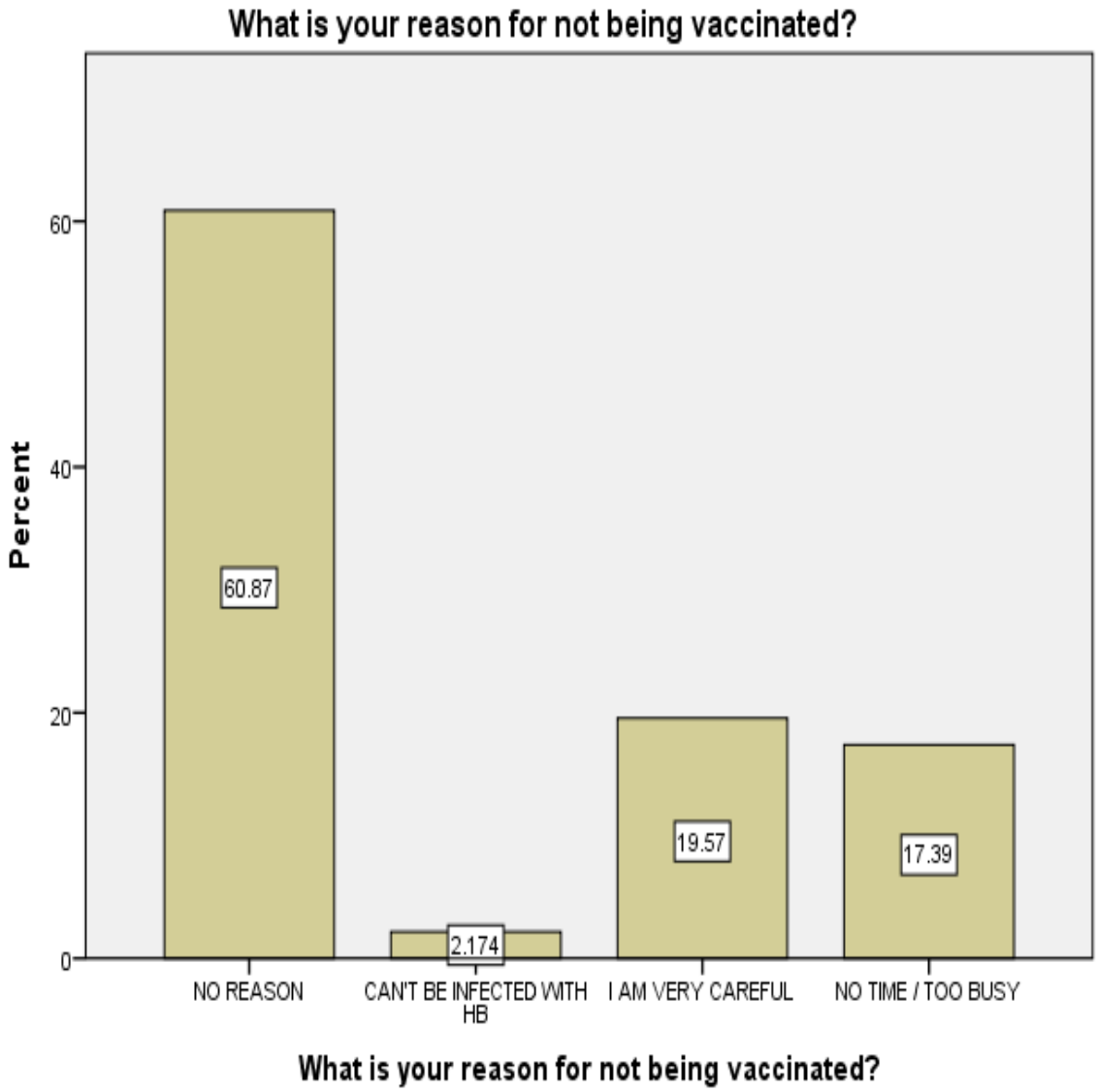


Figure 2: A bar chart showing details of reasons given for not being vaccinated



This study also had some limitations: because of the small sample size and the cross-sectional nature of the survey we were not able to assess factors responsible for low KAP and reported low HBV vaccination coverage.

Dependence on self-reported information of HB vaccination status was another limitation of this study. It is not known whether participants would tend to under or over-report their vaccination status.

In conclusion

The burden of infection from HB is very high, especially in the developing countries. In health care settings, a high prevalence may be due in part to the lack of sufficient knowledge and preventive measures by the health-care personnel.

Although the knowledge, attitude and practice reported in this current study is better compared to other studies, but this gap in knowledge and lack of practice of preventive measures is unacceptable for a health-care personnel, and should be bridged as a matter of urgency.

Therefore, there is a need for sustained training and awareness as well as wider uptake of the vaccine if HBV is to be minimized to the lowest level among HCWs in this part of the country.

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