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PRACTICES RELATING TO HEPATITIS B VIRUS INFECTION PREVENTION AND ITS DETERMINANTS AMONG HEALTH CARE WORKERS IN THE HO MUNICIPALITY, GHANA

BY

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DECLARATION

With the exception of the literature and books which I cited and duly acknowledged in this dissertation, I, Josephine Atsufi Kporngor, hereby declare that all information produced in this work is the result of my own work. No part of this study has been presented to an Institution of higher learning for the award of any degree.

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Josephine Atsufi Kporngor Date

(Student)

…… ……

Dr Reginald Quansah Date

(Supervisor)

DEDICATION

This work is dedicated to my lovely parents, siblings, and Richlord for their immense encouragement, support, and love showered on me throughout this study.

ACKNOWLEDGEMENT

I wish to express my sincere thanks and gratitude to the Almighty God for his unfailing love, mercies, blessing, grace, and favour bestowed upon me throughout this study. I am very grateful to my academic supervisor, Dr. Reginald Quansah, for his support, guidance, insightful suggestions, corrections, patience and time given me that led to the production of this study. I will also like to extend my gratitude to all lecturers of the School of Public Health who in diverse ways made my stay successful. I acknowledge immensely the Management of Volta Regional Hospital and Ho Municipal Hospital for the support they gave me during data collection. I am grateful to all my respondents who willingly agreed and participated in this study. Finally, I thank my Research Assistants for the diligence, skill and support they exhibited throughout data collection.

ABSTRACT

Background: Two billion individuals worldwide have evidence of past and recent HBV infection, and more than 257 million people are living with the infection. In addition, the prevalence of hepatitis B surface antigen is highest (≥8%) in underdeveloped countries including Ghana (with a prevalence of 12.3%). Meanwhile, Hepatitis B preventive measures are not routinely practiced by some health care workers in the country. The increased risk of infection among health care workers is due to their exposure to blood and bodily fluids because of the nature of their work. However, there is a paucity of data in Ghana regarding healthcare workers' practice of preventive measures concerning HBV infection.

Objective: This study assessed the practices relating to hepatitis B infection prevention and its determinants among health care workers in the Ho Municipality, Ghana.

Method: The study adopted a cross-sectional design using a quantitative method in a hospital-based survey. A structured questionnaire and an observational checklist were used to collect data. Three hundred and seventy-two (372) health care workers participated in the study over a period of eight weeks. Data collected was entered into a Microsoft Excel spreadsheet and analysed with Stata version 15.

Results: Findings from the study revealed that only 16.12% of the health care workers followed standard practice of prevention measures for hepatitis B. Factors associated with the proper practice of prevention measures for hepatitis B among health care workers were determined by the department the participants were working in, and availability of dustbin linings (AOR: 3.41, 95% CI: 1.09-10.73, p=0.036). Findings revealed that the health care workers had a high knowledge (69.6%) of the hepatitis B virus infection. However, there was a disconnect between the

knowledge of the hepatitis B virus infection, and the practice of prevention measures for the hepatitis B virus infection. The majority (83.52%) of health care workers have however been vaccinated against the infection. There was high availability of PPE (85.35%), handwashing facilities (97.8 %), and dustbin liners (72.16 %)

Conclusion: The study concludes that less than half of the participants in the study associated knowledge with proper practices. Also, the high availability of standard precautionary logistics did not translate into proper practice of HBV infection prevention measures among the health care workers. This urgently calls for continuous training of health care workers on infection prevention practices.

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LIST OF ACRONYMS/ABBREVIATIONS

A&E	Accident and Emergency
Anti-HBs	Hepatitis B surface antibody
CDC	Centre for Disease Control
EN	Enrolled Nurses
GHS	Ghana Health Service
HB	Hepatitis B
HBsAg	Hepatitis B Surface Antigen
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HCW	Health Care Workers
IPC	Infection Prevention and Control
Lab	Laboratory
O&G	Obstetrics and Gynaecology
PA	Physician Assistant
PEP	Post Exposure Prophylaxis
PPE	Personal Protective Equipment
RGN	Registered General Nurses
SP	Standard Precaution
WHO	World Health Organisation

OPERATIONAL DEFINITION OF TERMS

Health care workers: People who provided health care services to the sick that visited the health facility.

Knowledge: Information about HBV infection that is acquired through education or experience over years of practice.

Practice: The manner of carrying out procedures on clients/patients.

Preventive measures: Measures taken to prevent transmission of HBV from the patient to the health care worker and vice versa.

Standard Precautions: Standard precautions are a set of infection control practices used to prevent transmission of diseases that can be acquired by contact with blood, body fluids, non-intact skin (including rashes), and mucous membranes.

Hepatitis B: A severe form of viral hepatitis that is bloodborne, causing inflammation of the liver cells and damage to the liver which can be self-imposing or progress to fibrosis, cirrhosis or liver cancer.

CHAPTER ONE

INTRODUCTION

1.1 Background

According to the World Health Organisation, hepatitis is an inflammation of the liver cells that can resolve on its own or progress to fibrosis, cirrhosis or liver cancer (World Health Organisation, 2016a). Hepatitis is usually caused by hepatitis viruses A, B, C, D and E which are of great global public health concern, because millions of people worldwide have been affected (World Health Organisation, 2016a). This infection causes both mild and severe illnesses (such as liver cirrhosis and liver cancer), and mortality (World Health Organisation, 2016a). However, the hepatitis B virus is of key concern because of its slow and subtly harmful nature at the early stage of infection, and its late detection (World Health Organisation, 2016b). Also, HBV causes a more significant number of morbidity and mortality than the Human Immunodeficiency Virus (Lemoine, Eholié, & Lacombe, 2015; World Health Organization, 2017).

Globally, hepatitis B Surface Antigen (HBsAg) prevalence varies from one geographic area to another. Areas with a prevalence of less than 2 % indicate low endemicity, and areas with a prevalence of between 2% - 7% indicate moderate endemicity, while areas with a prevalence of $\geq$ 8 % indicate high endemicity (World Health Organisation, 2009; Mathers, Degenhardt, and Phillip, 2016). Furthermore, about 2 billion of the world population is estimated to have evidence of past or recent HBV infection, and 500 million people are chronically infected with viral hepatitis B virus(Schweitzer, Horn, Krause, and Ott, 2015; World Health Organization, 2017). An estimated 57% of cases of liver cirrhosis

and primary liver cancer result from HBV infection (Colvin & Mitchell, 2010; World Health Organization, 2013).

Africa happens to be one of the regions that are highly endemic (prevalence >8%) with hepatitis B virus (HBV) infection (Mathers, Degenhardt, & Phillip, 2016; World Health Organization, 2016b; World Health Organization, 2017), with about 100 million people estimated to have evidence of past and recent HBV infection (Schweitzer, Horn, Krause, and Ott, 2015; World Health Organization, 2017). The prevalence of hepatitis B infection in Ghana is also estimated at 12.3% (Ofori-Asenso & Agyeman, 2016).

The Hepatitis B virus can survive outside the body for at least seven days; is 100 times more infectious than the human immunodeficiency virus (World Health Organization, 2017; Mathers, Degenhardt, & Phillip, 2016), and causes acute and/or chronic liver disease (European Association for the Study of the Liver, 2012; World Health Organization, 2017). It is transmitted from person to person through exposure to infected bodily fluids such as blood, semen, and vaginal secretions (Centers for Disease Control and Prevention, 2014; World Health Organization, 2017). This can occur through non-adherence to infection prevention and control practices (such as standard precautions and vaccination), having unprotected sex with an infected person, unsafe blood transfusions, and unsafe use or reuse of syringes and needles(Center for Disease Control and Prevention, 2014; World Health Organization, 2017; Royal College of Physicians of Ireland, 2008). Those at risk of HBV infections include health workers, people who have multiple sexual partners, people who have unprotected anal sex, and people who inject drugs (Weinbaum, Mast & Ward., 2009; World Health Organization, 2017). Most people with HBV infections are asymptomatic and may not know they are infected. Others may show

symptoms such as jaundice, dark urine, extreme fatigue, loss of appetite, nausea, abdominal pain, liver cancer and acute liver failure, which may later lead to death (Weinbaum et al. 2009; World Health Organization, 2017; World Health Organization, 2017b; National Immunisation Advisory Commettee, 2008).

Health care workers particularly doctors, nurses, and laboratory technicians are at increased risk of hepatitis B infection. The Hepatitis B infection is incurable. However, its transmission can be prevented through good practices such as vaccination, and the routine practice of infection prevention and control practices (standard precaution and vaccination). This protects the health care worker and the patient from a hospital-acquired infection like HBV infection (World Health Organization, 2017). Other prevention strategies include safe blood and blood products transfusion, safe injection practices, and safe sex (World Health Organization, 2016a). Good infection prevention practices have been identified as key to ensuring good health, and reducing the spread of diseases such as the HBV infection among health care workers.

1.2 Problem Statement

Globally, health care workers are at an increased risk of occupational exposure to blood-borne pathogens through contact with human body fluids. One of the most work-related blood-borne infections is the HBV, and health care workers are ten times more at risk for contracting HBV (Tarantola, Abiteboul, & Rachline, 2006; Li, Mu, & Shih, 2010; Ul Haq et al., 2013; Oyewusi, 2015; Ahmed et al., 2016; Pellissier et al. 2012; Danaei, Vakili, & Momeni, 2011). In Ghana, the exact burden of HBV infection in the population is not known. However, a systematic review and meta-analysis of 30 cross-sectional studies among a heterogeneous population of blood donors/patients, pregnant women, voluntary

blood replacement groups, etc. from six regions (the Greater Accra, Ashanti, Brong Ahafo, Northern, Eastern, and the Central regions), reported HBV infection prevalence between 3.6% - 22.1%. Though the prevalence of HBV infection among the population living in the Volta region is not known, it may not be different from what has been reported in other regions (Ofori-Asenso & Agyeman, 2016).

Health care workers by virtue of their work are exposed to HBV infection when they come into contact with a patient, contaminated equipment and patient environment. As at now, no study had been conducted to find out the level of infection preventive measures or put in place by health care workers and their intitutions, to protect them from contracting the HBV infection in Volta region. This is a research question that this study sought to address since high prevalence greatly increases the risk of the health care workers by virtue of their occupation.

1.3 Explanation of Conceptual Framework

The conceptual framework as depicted in figure 1.1 shows the relationship between knowledge, hospital policy on HBV infection, socio-demographic factors, and availability of appropriate infection prevention logistics with practice relating to hepatitis B virus infection prevention (the outcome of interest). Socio-demographic factors included but not limited to educational level, occupation, years of practice, age, cadre, and sex all influence practices on infection prevention (Olanrewaju, Adenike, Faronbi, Adewale, & Modupe, 2018; Hegazy, Albar, & Albar, 2016; Kabir et al. 2010)). Knowledge is also known to contribute to individuals' practices (Colvin & Mitchell, 2010; Mesfin & Kibret, 2013). Hospital policy on HBV infection and availability of appropriate logistics (Hand hygiene facilities; personal protective equipment (gloves, gowns, face masks or shields, rubber aprons, boots,

hair gear); appropriate colour-coded dustbins with appropriate liners), was also indicated to influence practices of the health care workers (Adekanle et al. 2015; Oyewusi, 2015; Hegazy et al. 2016). Again, knowledge depends on socio-demographic factors which in turn impact on practices relating to HBV infection prevention. The diagram in figure 1.1 explained this relationship.

1.4 Conceptual Framework

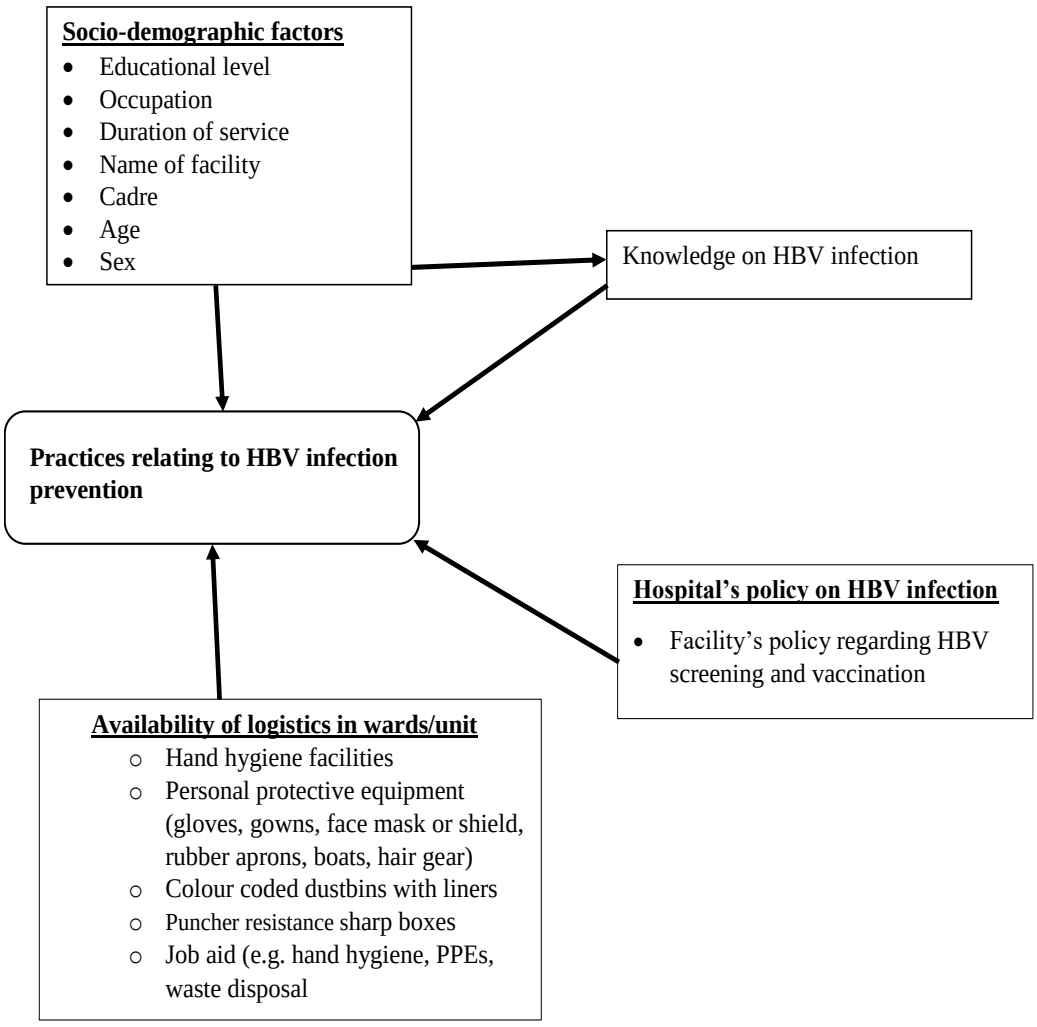

Figure 1.1: Some factors contributing to the practices of HCW towards HBV infection prevention of transmission

1.5 Justification of the study

Generally, limited studies have been conducted in Ghana on health care workers' practices in relation to HBV prevention. Only one available literature was identified on health care workers' knowledge, attitudes, and practices, which concluded that knowledge, attitudes, and practices were inadequate (Afihene, Duduyemi, & Khatib, 2015). There is a need to conduct similar studies in other health care facilities in the country. Therefore, findings from this research will inform facility managers and policymakers on the extent to which health care workers comply with HBV infection prevention measures. Also, gaps identified in this study would aid in the development of more specifically targeted health promotion, screening, and vaccination programmes for health care workers.

1.6 General Objective

To determine the proportion of healthcare workers in Ho Municipal, practicing HBV infection prevention measures and their associated risk factors.

1.7 Specific Objectives

1. To determine the proportion of healthcare workers who adhered to standard precautionary measures towards HBV infection prevention.
2. To determine the proportion of healthcare workers vaccinated against HBV infection.
3. To identify participants' knowledge level on HBV infection and its preventive measures.
4. To identify factors associated with practicing HBV preventive measures.

CHAPTER TWO

LITERATURE REVIEW

2.1 Scope of the review

The review was done by electronic search of Hinari, Embase®, PubMed, and Google Scholar databases that reported the practice of HBV prevention practices among health care workers worldwide. The following search words/terms were used: HBV infection prevention, practices, health care workers, knowledge on HBV, and HCW practice of the prevention of HBV infection, Ghana, Africa. The literature review inserted is organised under the following heading;

- Health care workers' knowledge of Hepatitis B disease.
- Practices of health care workers relating to hepatitis B prevention.
- Availability of logistics for HBV infection prevention practice
- Hospital policy on the HBV infection
- Socio-demographic factors associated with health care workers (HCW) practice of HBV infection prevention

2.2 Health care workers knowledge on the hepatitis B disease

It is very important for all categories of health care workers to have adequate knowledge of the HBV disease. This is key for the prevention and control of HBV infection among health care workers (Colvin & Mitchell, 2010; Mesfin & Kibret, 2013; El-fetoh, Thaib, Alenzi, & Ghabban, 2017). Knowledge of disease transmission process, sequela, and prevention practices will enable people to make informed decisions to prevent the occurrence of infections, and control of disease (Colvin & Mitchell, 2010; Mesfin &

Kibret, 2013). Health care workers are expected to have adequate knowledge on HBV infection. However, several studies have reported inadequate knowledge of health workers on the HBV disease, as participants failed to identify all modes of HBV transmission, prevalence, risk population, and the importance of vaccination in disease prevention (Adekanle, Ndububa, Olowookere, Ijarotimi, & Ijadunola, 2015; Chao, Chang, & So, 2010; Kabir et al. 2010; Adekanle et al. 2015). This finding was supported by another study conducted by Mesfin, & Kibret, (2013) that assessed the knowledge and practice of health workers towards hepatitis B. Findings reveal that (43.8%) of the respondents had poor knowledge. It was concluded that the respondents had inadequate knowledge about Hepatitis B transmission and prevention (Mesfin & Kibret, 2013). Similarly, another study conducted among Iranian medical specialists (dentists, general practitioners, para clinicians, surgeons, and internists) regarding Hepatitis B and C in a cross-sectional study showed that the knowledge of the medical specialists was unsatisfactory (Kabir et al. 2010). This was attributed to the fact that the medical specialists' knowledge of routes of transmission, prevalence, protection, and post-exposure seroconversion rate was moderately low (Kabir et al. 2010). This assertion was again supported by Chao, Chang, & So, (2010) in a cross-sectional quantitative study on Hepatitis B knowledge and practice among health care professionals in China. Results from the study revealed that 34% of respondents did not know that chronic HBV infection is often asymptomatic, and 29% did not know that chronic HBV infection confers a high risk of cirrhosis, liver cancer, and premature death. Additionally, 34% of respondents failed to recognize all the modes of HBV transmission, and 30% did not know the importance of the hepatitis B vaccine in preventing liver disease. Another study conducted by Bakry, Mustafa, Eldalo, & Yousif,

(2012) in Sudan reveals poor knowledge about universal precaution guidelines among doctors, nurses, laboratory technicians and other paramedical personnel. Finally, a study to determine health care workers' knowledge of hepatitis B and its vaccine at Bahir Dar City, revealed poor knowledge of health workers on hepatitis B and its vaccine (Abeje & Azage, 2015). However, they also stated that the study faced some challenges such as finance.

It is worth mentioning that quite a number of studies across the globe also indicated substantial knowledge of health care workers on hepatitis B infection (Bakry, Mustafa, Eldalo, & Yousif, 2012; Abiola, Omoyeni, & Akodu, 2013; Mehriban, Ahsan, & Islam, 2014). Mehriban et al. (2014) noted in their study on knowledge and preventive practices regarding Hepatitis B among nurses using a cross-sectional (with a questionnaire) approach that most of the respondents (nurses) had adequate knowledge (67.3%) on hepatitis B virus infection. Respondents knew HBV infection could be transmitted by unsafe sex (88%), infected blood transfusion (98%), needle sharing (98.7%), and using the same razor, or by piercing/tattooing by the same object (86%). In addition, majority 84.3% of respondents are aware that healthcare workers are at risk of getting HBV infection, 79.7% knew they can spread the disease, and 91.7% also knew that HBV infection can lead to hepatocellular cancer or cirrhosis.

Congruently, health care workers at the Lagos State accident and emergency centre who participated in the study on knowledge, attitudes, and practice of hepatitis B vaccination using a cross-sectional descriptive approach among health workers show good knowledge of HBV infection and vaccination with a mean knowledge score (%) of 61.2 ± 20.7. The majority (90.4%) knew they can acquire HBV infection through needle stick injury, and 67.9% was aware of the availability of an effective vaccine against the disease (Abiola,

Omoyeni, & Akodu, 2013). Similarly, another study conducted by Bakry, Mustafa, Eldalo, & Yousif, (2012) at Sudan reveals that 97.2% of doctors, 98.6% of nurses, 94.8% of laboratory technicians and 95.7% of other paramedical personnel were aware that HBV could be transmitted through infected blood. Ahmed et al., (2016) also revealed good knowledge of health care workers about HBV transmission and prevention in their study, but concluded that laboratory technicians and labourers had poorer knowledge compared to doctors, pharmacists, nurses, midwives, and theatre operators. Findings from another cross-sectional descriptive study conducted in Ghana among 175 health care workers of Suntreso Government hospital shows that the respondents had adequate knowledge of hepatitis B with a mean knowledge of 13.69 ± 2.81 (Afihene et al. 2015). This study was limited by inadequate responses and small sample size.

Findings from a study conducted by Oyewusi, (2015) on knowledge and utilization of Hepatitis B infection preventive measures, and influencing factors among health care workers in Ibadan, Nigeria, in a descriptive survey utilizing a quantitative approach indicated that knowledge of hepatitis B preventive measures did not translate into proper practice of preventive measures. 65.2% had good knowledge, but only 37.6% put the measures into practice. The above observations were supported by another study by Mehriban et al. (2014) on knowledge and preventive practices regarding Hepatitis B among nurses using a cross-sectional (with a questionnaire) approach. Findings from the study concluded that most of the respondents (nurses) had adequate knowledge (67.3%) on hepatitis B virus infection, but it had no influence on their prevention practice (49.3%).

2.3 Practices of health care workers relating to hepatitis B prevention

The preventive measures which can be taken by health care workers to prevent and reduce occupation-related blood-borne infections include adhering to standard precautions, and vaccination against the disease (Chao et al. 2010; Ministry of Health, 2015).

Standard precautions are work practices essential for basic Infection Prevention and Control (IPC). The components of standard precautions are proper hand hygiene, appropriate use of Personal Protective Equipment (gloves, aprons, gowns, goggles, hair gear, and protective footwear), appropriate sharp objects management, proper waste management, effective processing of used patient care equipment, etc (Ministry of Health, 2015). These practices are to be applied during all patient-health care worker interactions with likely exposure to blood, body fluids, and pathogens (Ministry of Health, 2015).

For prevention of needle stick injuries, needles are not to be recap before disposal into appropriate receptacles except in exceptional cases. Koria & Lala, (2012) indicated that all 60 laboratory technicians in their study were using disposable needles and syringes in rendering services to the patient/client. Also recapping of needles was not a practice except in exceptional cases. However, in a study conducted by Bakry, Mustafa, Eldalo, & Yousif, (2012) among nurses, doctors, laboratory technicians, and some paramedics showed that 81% of the responding providers were routinely used to recapping of needles after use. This observation was backed by Kabir et al., (2010) and Oyewusi, (2015) whose studies indicated that 73.4% and 30.5% of respondents respectively, always or often recap needles before discard. Another study revealed that 32% of health care workers practiced the sharing of needles (Mehriban et al. 2014). For unsafe handling of sharps, findings from a

study by Afihene et al. (2015) reveal that 29.1% of participants in their study had been exposed to needle stick injury.

Personal Protective Equipment serve as a barrier of protection for both health workers and patients alike. Gloves are used to protect the hand from contamination with blood or body fluids. A study among doctors in Sudan indicated that only 33% of them were always wearing gloves during patient-health care worker interaction This increase their risk of coming into contact with blood and body fluids (Bakry, Mustafa, Eldalo, & Yousif, 2012). Also, only 24% of health care workers out of 61.3% who did surgical procedures often used double gloves during patient care (Kabir et al. 2010). Contrary to the above findings a study by Ahmed et al. (2016) shows that 92.8% of participants in their study were wearing gloves whenever there is contact with blood. On the other hand, Koria and Lala, (2012) in their study reported that all laboratory technicians that took part in their study used aprons while working. Another study indicated that only 46.3% used gowns while handling patients, (Mehriban et al. 2014) while 43.8% of them always used glasses and or masks during patient care (Kabir et al. 2010).

Regular proper handwashing is a vital and good practice in reducing exposure from prolonged contamination of the skin with infectious fluids. A report from a study in Nigeria revealed that about 52% of doctors and 76 % of nurses (P = 0.002) always practiced hand hygiene between patient care. However, 10 % of the laboratory technicians did not wash their hands after the removal of the gloves (Koria & Lala, 2012).

Safe and proper disposal of health care waste (HCW) was practice by 82% of laboratory technicians as waste generated was disposed into appropriate containers, and used needles

and syringes were also safely disposed of by about 89.3% of the Laboratory technicians (Koria & Lala, 2012).

It has been indicated by the World Health Organization, (2017) that about 95% of people infected with Hepatitis B virus are unaware of their status. However, vaccination is one of the most important practices for preventing HBV infection. It is, therefore, very vital for health care workers to get tested, and to receive the hepatitis B vaccine. This is because only persons who test negative to the HBV disease can take the hepatitis B vaccines. When asked if a blood test was done for hepatitis B, 69.3% of health care workers attest to the fact that they have been tested for hepatitis B, (Mehriban et al. (2014) and 34.3% in another study by Abdela, Woldu, Haile, Mathewos, & Deressa, (2016) also attested to the fact that they were tested. However, in another study involving laboratory technicians, it was noted that all study participants were tested for hepatitis B (Koria & Lala, 2012).

Vaccination of health care workers is the mainstay of reducing the risk of occupational infections, and preventing the transmission of infections, and also plays a key role in protecting them against HBV; however, it remains a problem in many countries (Koria & Lala, 2012: Mehriban et al. 2014: Fortunato, Tafuri, Cozza, Martinelli, & Prato, 2015: Malewezi, Omer, Mwagomba, & Araru, 2017).

Several studies worldwide indicated low hepatitis B vaccination coverage among health care workers. This is evident in the study of Abeje and Azage, (2015) where only 20 (5.4%) out of 370 respondents reported having taken three or more doses of hepatitis B vaccine. This claim was not different from other studies conducted on vaccination status among health care workers, pointing to the fact that 84% of respondents had poor vaccination status (Mehriban et al. 2014); 41% of respondents had poor vaccination status

(Adekanle et al. 2015); 35% of respondents had poor vaccination status, and less than 50% of participants had poor vaccination status respectively (Ahmed et al. 2016).

Similarly, a study conducted among 286 health care providers in Gondar University Hospital, Ethiopia by Ayalew & Horsa, (2017) reported that 51% of the respondents had never received the hepatitis B vaccine, and only 58.6% of those who received the vaccine completed the full course. Therefore, the overall vaccination status against the hepatitis B virus among participants in the study was only 28.7% (Ayalew & Horsa, 2017).

Reports from a research conducted, revealed that only 9% of respondents from Cameroon, 35% from Ethiopia Gujarat, and 7.2% from Niger indicated to have successfully completed the primary vaccination (first three dose) against HBV infection (Koria & Lala, 2012, Pellissier et al. 2012, Ayalew & Horsa, 2017, Mesfin & Kibret, 2013, Abeje & Azage, 2015, Olivier et al. 2016). Another study conducted in Iran reveals high (88.1%) completion of vaccination. Also, 8.1% had insufficient vaccination (less than three doses) and 3.9% of them were yet to complete vaccination. However, 60% of the participants had checked their hepatitis B surface antibody (anti-HBs) level, of whom 83.8% were positive (Kabir et al. 2010). This finding is contrary to the low completion of vaccination in the above-mentioned studies (Hegazy, Albar, & Albar, 2016, Kabir et al. 2010).

Despite the challenge of vaccination among health care workers, some studies conducted across the globe indicated a relatively good vaccination rate of health care workers against this disease. Malewezi, Omer, Mwagomba, & Araru, (2017) conducted a study among health care workers to review practices, measures, and challenges in Sub-Saharan Africa relating to health workers' vaccination against HBV. Results from this study indicated that vaccination was fairly high, but vaccination rates were lower, with 4.6% to 64.4% of those

"ever vaccinated" completing the vaccination regimen. This claim is not different from that of Ziglam, El-hattab, Shingheer, Zorgani, & Elahmer, (2013) whose study reported an overall vaccination coverage (anti-HBs) of 78.1 %. They further indicated that 82.6% of the respondent (health care workers) had received at least one dose of vaccine, but only 72% reported that they were completely immunized. Also, a study conducted in Ghana reveals that 69.7% of participants have been vaccinated and 36.6% had their immunity checked. Out of those who had their immunity checked, 77.5% were immune against HBV (Afihene et al. 2015).

2.4 Availability of logistics (IPC) for HBV infection prevention practice

Availability of infection prevention and control logistics such as PPE, appropriate hand hygiene facilities, and waste disposal bins and liners have been cited as a key determinant of adherence to HBV infection practices. In a study conducted by Bakry, Mustafa, Eldalo, & Yousif, (2012) it was reported that gloves were not readily available in all units where there was a high risk of infectious occupational exposure. These findings increase the risk that the health care workers are exposed to (Oyewusi, 2015).

2.5 Hospital policy on HBV infection

Institutionalization of hospital policy was indicated as important to HBV infection prevention because it will guide the practices of the workers in the hospital. Some studies also indicated that health facilities where these studies were conducted, did not have a policy regarding hepatitis B and this influenced the practices of the health care workers badly (Adekanle et al. 2015; Oyewusi, 2015; Hegazy et al. 2016; Ogunlade, 2016).

2.6 Socio-demographic Factors associated with health care workers (HCW) practices on HBV infection

Practices of HCW on HBV infection can be influenced by some socio-demographic factors such as age, sex, duration of services and cadre of staff. However, a study conducted in Ghana by Afihene et al. (2015) noted no significant association between age, occupation, and working experience with respect to practice scores. This finding was supported by another study conducted by Olanrewaju et al (2018) in Nigeria which indicated that years of experience were not associated with the practice of prevention of HBV Infection (P = 0.056). Another study conducted in Ethiopia by Mesfin and Kibert (2013) reported that males had more preventive practice toward HBV than females. Olanrewaju et al. (2018) in their study on knowledge and practices of hepatitis B prevention among health care workers in Ilesa, Osun State, Nigeria, noted in their study that years of experience did not influence the practice of prevention of hepatitis B virus infection (p=0.056). Another study by Mehriban et al. (2014) in assessing knowledge and preventive practices regarding Hepatitis B among nurses in some selected hospitals of Dhaka city, Bangladesh conducted a bivariate analysis that showed an association between age and knowledge with the practice of preventive measures of hepatitis B virus infection.

Complete HBV vaccination was significantly associated with knowledge about viral hepatitis prevalence, age, duration of work and profession (Hegazy, Albar, & Albar, 2016, Kabir et al. 2010). Factors determining uptake of HBV vaccine among health care workers are having had a previous HBsAg test, having sufficient information on the vaccine, educational level, type of profession, age, and marital status (Adekanle et al. 2015, Olivier et al. 2016: Ayalew & Horsa, 2017). However, commonly mentioned barriers for non-

uptake of vaccine included non-availability of hepatitis B vaccines, long vaccination schedule of the vaccine, cost, lack of time, forgetfulness, lack of awareness of vaccine availability, fear of side effect of the vaccine, and inadequate information concerning the vaccine (Colvin & Mitchell, 2010, Ziglam et al. 2013, Adekanle et al. 2015, Kumar et al. 2015, Olivier et al. 2016, Malewezi et al., 2017, Ayalew & Horsa, 2017).

Knowledge of health care workers on HBV infection is influenced by some socio-demographic factors such as age, sex, duration of services, and cadre of staff. A study by Olanrewaju et al (2018) on the knowledge and attitude of health care workers regarding HBV infection and its vaccinations using a self-reported questionnaire in Ethiopia, Addis Ababa reported that medical doctors have 8.4 times better knowledge of HBV and its vaccination than other professionals. This finding was supported by another study conducted by Olanrewaju et al. (2018) in Nigeria which reveals that Knowledge was associated with an academic qualification. However, a study conducted by Hassan et al., (2016) indicated that there was no significant association between good knowledge of HBV infection and socio-demographic factors defined as age, sex, cadre, duration of service, marital status, and religion. This finding was supported in another study conducted in public hospitals in White Nile State. It indicated no relationship between age, sex, and marital status with knowledge of health care workers (Ahmed et al., 2016). This was contrary to another finding from another study conducted by Afihene et al. (2015) in Ghana that indicated a significant relationship between age, occupation and working experience. Similarly, findings from a study conducted by Hajarizadeh, Wallace, Richmond, Ngo, & Enright, (2015) indicated that age and educational level was associated with hepatitis B knowledge. Another study revealed a positive correlation between the

education status of the workers, and their knowledge of HBV transmission and prevention. Doctors, pharmacists, nurses, midwives, and theatre operators had better knowledge as compared to laboratory technicians and labours (Ahmed et al., 2016).

2.8 Conclusion

The literature reviewed here shows that a substantial number of studies have been conducted on the knowledge levels, practices, testing and vaccination status of HCW in relation to Hepatitis B virus disease in different countries. There is, however, only one study at the time of this research, conducted in Kumasi, Ghana which assesses HCW knowledge, attitudes and practices on Hepatitis B. It is, therefore, essential to conduct a similar study in Ho, Ghana, among groups of health care workers since it is in a different region.

The majority of the studies reviewed in this section (literature review), employed a quantitative research approach. A few others also used the mixed-method approach in assessing the knowledge, attitudes, and practices of HCW on hepatitis B disease. Thus, administering questionnaires and using interviews as well. However, the observation of HCW practices at work on disease transmission prevention was not employed. This is an important way to tell whether responses given by participants really correspond to what they practice. In this study, therefore, observation will be one of the ways to collect data in addition to the questionnaires.

In addition, the review clearly revealed that there was inadequate preventive practice with respect to hepatitis B, among health care workers in most of the review study. Also, hepatitis B testing was woefully low. The reason for this low testing is not known and

vaccination status is also very low, despite the prevalence of the disease in the populace, and the infectious nature of the virus (hepatitis B).

Some limitations identified from the studies reviewed were inadequate responses, small sample size, inadequate financial resources self-reports without any form of verification, and time constraints. These limited the scope of the studies. Despite these limitations, review studies have several strengths such as providing a succinct summary of issues, build upon previous studies and adoption and modification of data collecting tools used (questionnaire).

CHAPTER THREE

METHODOLOGY

3.1 Study design

A cross-sectional survey involving various categories of health care workers (Doctors, Physician Assistants, Nurses/Midwives, Health Assistants, Lab Scientists/Technicians, and Housekeeping staff) at the Volta Regional Hospital and Ho Municipal Hospital within Ho Municipal of Ghana was carried out. A self-administered questionnaire and direct observational checklist were used in the data collection. The study was carried out between the periods of June to August 2018.

3.2 Study area

The study was conducted in the two-public hospitals; - Volta Regional Hospital and the Ho Municipal Hospital in the Ho Municipal.

Ho metropolis is located in the Volta Region, and is one of the 25 districts in the region. Ho is the administrative capital for the Municipal. The population of Ho Municipal according to the 2010 population and housing census was 177,281. The Municipal is bounded to the south by Adaklu and Agotime-Ziope Districts, to the north and west by Ho West District and to the east by the Republic of Togo. The municipal has two hospitals and other health facilities (polyclinic, clinics and CHPS compounds).

Volta Regional Hospital is the regional hospital for Volta Region and is the first referral point for all 21 hospitals in the region. It is located on 6.60126^0 North and 0.48404^0 East, in Ho. Its construction was completed and handed over in November 1998 and service delivery commences in April 1999. However, the regional hospital was commissioned in

December 2000. It is bounded to the east by the medical village road, to the west by the University of Allied Sciences, to the north by the Ho-Denu road and to the south the medical village. It is a 306-bed capacity facility with a staff strength of 602. The facility offers both general and specialist care services in all the major clinical disciplines including internal medicine, surgery, obstetrics and gynaecology, paediatrics, Accident and Emergency, laboratory, herbal medicine among others.

Ho Municipal Hospital is the referral point for facilities in the Ho Municipality. It is located in the heart of Ho on a total surface area of 3.93 Acres. It is bounded on the east by the Birth and death office separated by Glalah Street, to the west by telecommunication, to the north by Ho Prisons separated by the Residency road and south by the regional museum and District Police Headquarters. It is a 140-bed capacity facility with a total staff strength of 388. Ho Municipal Hospital primarily provides curative and preventive care. Services provided by the facility include medical services, surgical services, paediatric care services, obstetric and gynaecological services, maternity services, accident and emergency services, diagnostic services, pharmaceutical services, and other services. Figure 2.2 indicates the location of the two facilities within Ho municipal.

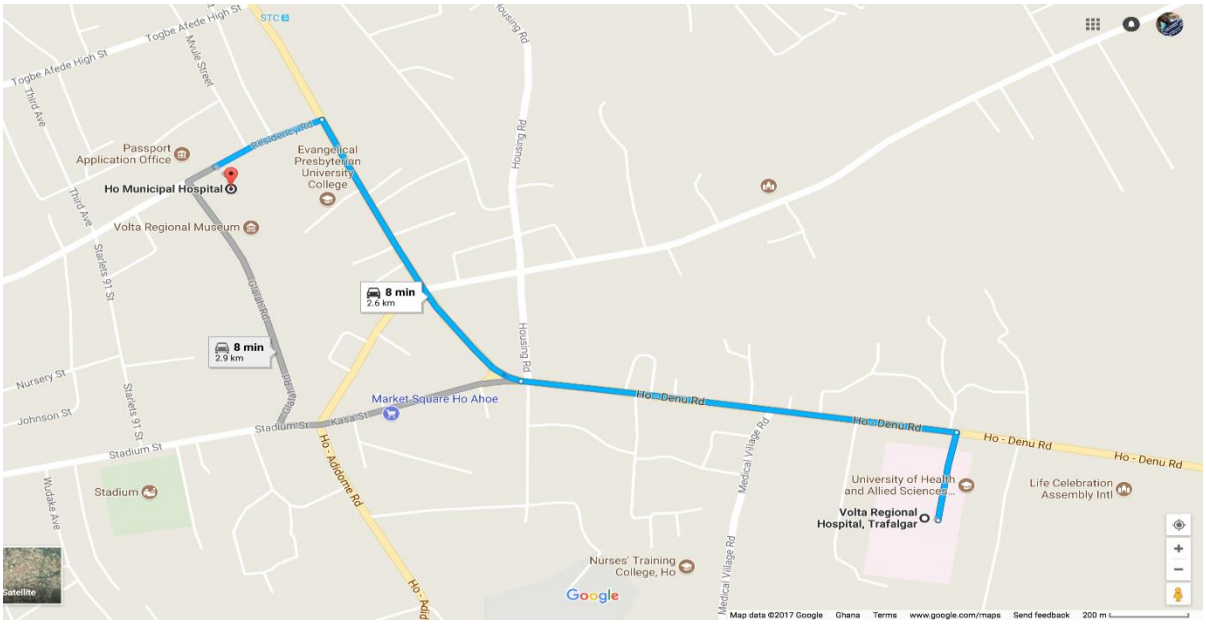

Figure 2.2: Map of Ho Municipality indicating the location of the two hospitals

3.3 Study/ target population

The source population included all 651 health care workers (nurses, midwives, doctors, physician assistants, health assistants, laboratory scientists/technicians, and housekeeping staff) at the Volta Regional Hospital and Ho Municipal Hospitals. From this, 273 health care workers were randomly selected (see section 3.7.2)

3.4 Inclusion criteria

All permanent health care workers (nurses, midwives, doctors, physician assistants, health assistants, laboratory scientists/technicians, and housekeeping staffs) of the hospitals, working in selected departments/units (medical, surgical, paediatric, accidence and emergency, obstetric and gynaecologic wards and the laboratory department), available at the time of data collection, and willingly consented, were enrolled in the study.

3.5 Exclusion criteria

All temporal (on rotation /attachment /national service) health care workers (nurses, midwives, doctors, physician assistants, health assistants, laboratory scientists/technicians, and housekeeping staffs) in the hospitals and/or not in selected units (medical, surgical, paediatric, accidence and emergency, obstetric and gynaecologic wards, and the laboratory department) were excluded.

3.6 Study variables

3.6.1 Outcome variables

The main outcome of interest was practiced relating to HBV infection prevention. It was measured using 7 items observational checklist developed based on literature (Afihene et al. 2015; Ayalew, Horssa, Getachew, Amare, & Getnet, 2016; Hassan et al., 2016; Olanrewaju et al. 2018). It covers adherence to infection prevention practices and vaccination status. Adherence was defined as performance of good hand hygiene practices between patient care, use of appropriate gloves whilst undertaking task that are likely to expose an individual to bodily fluids, recapping of used needles, appropriate use of other personal protective equipment during patient and housekeeping activities, waste segregation, and appropriate disposal of needles and sharps. Vaccination status was also defined as vaccinated or not vaccinated against HBV infection.

3.6.2 Independent variables

The main independent variables of interest were knowledge on HBV infection, socio-demographic factors (age, sex, cadre, educational level, occupation, and duration of service), availability of infection prevention and control logistics and hospital's policy on HBV infection.

Participant's knowledge on HBV infection and prevention section considered five domains:

1) general knowledge on HBV (6 items);

2) route of transmission (5 items);

3) mode of transmission (2 items);

4) sequel (4 items);

5) prevention (5 items)

Availability of logistics in the wards or units inquired about presence/absence of hand hygiene facilities on the various wards and units, whether appropriate PPE is available for use on the wards/unit while caring for patient/client (gloves, gowns, facemask or shield, rubber aprons, boots and hair gear), colour-coded dustbins with liners for waste segregation, puncher resistance sharp boxes, and job aid (on hand hygiene, wearing and removal of PPE and waste disposal). Hospital policy on HBV infection inquired about the facilities policy for protection of healthcare workers against HBV infection.

3.7 Sampling

3.7.1 Sampling Method

Stratified random sampling technique was employed to proportionately recruit 273 (see table 1) health care workers (nurses, midwives, doctors, physician assistants, health assistants, laboratory scientists/technicians, and housekeeping staff) from the two hospitals. First, HCW was stratified based on hospital, and category of staff. Secondly, the sample size was distributed proportionally to each hospital and category of staff based on

the population they have. Thirdly, names of all nurses/midwives, doctors/physician assistants, health assistants, laboratory scientists/technicians, and housekeeping staff were written on pieces of papers, folded and put into separate bowls on category bases. Finally, participants were blindly hand-picked from the bowls containing the names. Informed consent was sought and obtained from the selected participants for their participation. Voluntary participation was ensured without any risk attached while the right not to participate in the study was respected.

Table 3.1: Proportionate distribution of health care workers in Ho Municipal

Category of HCW	**Population of HCW in each category**	**Volta Regional Hospital**	**Ho Municipal Hospital**	**Total Sample size of HCW in each category**
Nurses / midwives / Health assistants	487	131	73	204
Doctors / PA	44	13	5	18
Laboratory scientists / technicians	28	7	4	11
Housekeeping staff	96	30	10	40
Total	**651**	**181**	**92**	**273**

3.7.2 Sample size calculation

The sample size of 273 was calculated by using a sample determination formula [nh = $N/1+N(e)^2$] by Israel (1992) in the paper sampling the Evidence of Extension Program Impact.

Where

nh = sample size

N = study population

e = margin of error estimated as (0.05 or 5%) with a confidence level of 95%

Therefore, with a study population of 651;

$$nh = \frac{N}{1+N(e)^2}$$

$$= \frac{651}{1 + 651(0.05)^2}$$

$$= \frac{651}{1 + 651(0.0025)}$$

$$= \frac{651}{2.6275}$$

= 247.7640

= approximately 248

Considering a 10% incomplete questionnaires and non-response, n ≥ 248 + 24.8 = 272.8 thus approximately 273. The minimum sample size for the study was 273.

3.8 Data Collection

The data collection procedure was in (2) phases. First, four field workers were briefed on the purpose of the study and trained on interview techniques, checklist administration and data management. This was followed by letters to management and ward/unit in-charges of

the two facilities to sort permission to collect data in their facilities. Following approval from the management of the hospitals, duty rosters of staff in the selected departments (see section 3.7.1) were requested from the management of the two hospitals and used to randomly select participants for the study (see section 3.7.1). A meeting was arranged with healthcare workers (HWC) to agree on the date and time for the interview. At this meeting, the purpose of the study was also explained to them.

From Monday to Friday each week for 2 months field workers interviewed study participants with a structured questionnaire. The questionnaire was in two parts. Part 1 is on socio-demographics and inquires of participants' age, sex, years of practice, education, profession, and department. The second part which dealt with knowledge on HBV infection and prevention was in five sections. Section 1 looked at general information on HBV (causal agent of HBV infection, length of period the virus can survive outside the host, etc). Section 2 dealt with the route of transport, section 3 inquired about the sequel, section 4 dealt with prevention and section 5 the mode of transmission (see Appendix 2). Each question had multiple responses for participants to choose from. A correct answer attracted a score of '1' and the wrong answer attracted a score of '0'. The correct answers were summed up to generate a total score of 22. Participants scoring below 11 were considered as having poor knowledge, those scoring between 11 and 16 were considered having moderate knowledge and those scoring 17 or more were considered having good knowledge (Ahmed et al., 2016). Each interview lasts for about 30 minutes.

Participants were also observed with a 7-item checklist when performing the same or similar procedure on a patient for 10 consecutive times. The items on the checklist include a statement such as practice good hand hygiene between patient care; recap needles after

use; wear appropriate gloves when performing an activity that is likely to expose you to blood and body fluid; discard needles and sharps immediately after use, etc. The response to these questions was ‘always or sometimes’. The ‘always’ responses were summed up to generate a total score of 7. A score of ‘0-4’ was rated as ‘poor’ and ‘5-7’ was rated as ‘good’ (Ahmed et al., 2016). On average each participant was observed for 2 days in the department.

3.9 Data processing and analysis

Each questionnaire was coded and entered into Microsoft Excel. Data was cleaned and exported into STATA version 15 for statistical analysis. Descriptive statistics such as frequencies, means, and standard deviations were used to measure the baseline socio-demographic and other data.

The overall practice for respondents was analysed and categorised into two levels using the quartile range as a cut-off point for good and poor practices from the observational checklist that assess participants' practice (standard precautionary practices) and one question on vaccination status. Six of the questions were on the observational checklist and labeled ‘Sometimes’ and ‘Always’. Responses with ‘Always’ were considered as good and given a score of ‘1’ and the ‘Sometimes’ was considered inadequate and score zero. Also, vaccination status was scored one if the respondent was vaccinated and score zero if not vaccinated. The seventh question was on vaccination status and HCW against HBV infection. Total practice score ranges from a maximum of 7 to a minimum of 0; a score of 0-4 was considered poor practice and 5-7 was considered as good practice (Ahmed et al., 2016).

The overall knowledge of respondents was tested based on 22 variables on the cause, transmission, sequel, and prevention practices. Each desire response to a variable was given a score of '1' point and wrong response a score of '0', thus giving a maximum of 22 scores and a minimum of 0 scores. Knowledge of health care workers was classified into three levels using quartile range as cut off points for knowledge level (Ahmed et al., 2016); a total score of $\leq$ 10 was considered as poor knowledge, 11-16 scores as moderate knowledge and 17 and above was considered as good knowledge about HB and its preventive measures.

Logistic regression (bivariate and multivariate) was used to determine the relationship between outcome variable (practice) and independent variables (selected socio-demographic, vaccination status, hospital policy on HBV infection, availability of IPC logistics and knowledge on HBV infection and prevention).

Chi-square was also used to test for significance relationship between knowledge and practices. Variables that were statistically significant in the logistic regression model were further tested for the strength of association. All level of significance was determined at $p < 0.05$.

3.10 Quality Control

The self-developed questionnaire and observational checklist were edited by my supervisor to ensure the accuracy of the tools. The questionnaire for data collection and standard observational checklist for assessment were pre-tested at Ho Polyclinic. Ten health care workers of various categories were randomly selected over a period of seven days for pre-

testing. This was done to test the efficiency, reliability, and validity of the data collection tools and to test respondents' understanding of the questions on the questionnaire.

Four research assistants with adequate knowledge on the topic of the study were recruited and trained on the use of the questionnaire, direct observational checklist, data collection technique, and field procedures. To ensure the accuracy of data collected, research assistants were supervised by the principal researcher within the period of data collection. Completed questionnaires would be safely kept in a well-labeled file and destroy after five years after the study.

3.11 Ethical Consideration/Issues

Ethical clearance was sought from The Ghana Health Services Ethical Review Committee Board and clearance was given before the data collection. Permission to carry out the study was obtained from the management of the two hospitals (Ho Municipal Hospital and Volta Regional Hospital).

Health care workers who participated in the study gave their consent prior to the study. Respondents were recruited according to the study criteria and questionnaires administered by trained research assistants and principal investigator. Confidentiality and anonymity were maintained, and participation was entirely voluntary after the purpose of the study was explained to all participants individually. The risk that this study posed to participants was minimum. Thus discomfort associated with answering questions which took some time to complete and being in the known of being observed whiles working.

The study was solely funded by the principal investigator and there was no conflict of interest.

CHAPTER FOUR

RESULTS

4.1 Socio-demographic characteristics of the participant

All 273 health care workers (nurses, midwives, doctors, physician assistants, health assistance, laboratory scientist/technician and housekeeping staff) who were included in the study were interviewed with a structured questionnaire (response rate of 100%). Of these, 66.3% were from Volta Regional Hospital and 33.7% were from Ho Municipal Hospital.

The mean age of participants was 35.7 (Std ± 7.12) years with the majority between the ages of 25-34 years 48.72%. The majority of the study participants were females 72.16%, Nurses/Midwives and Health Assistants constituted 74.73% of participants, had diploma education 52.75%, work for 1-5 years 32.6% and the majority of participants were from medical department 28.94%. The response to the socio-demographic characteristics is written in Table 4.1 below.

Table 4.1: Socio-demographic Characteristics of participants (N = 273)

Variables	All participants N(%)	Health Facilities	
		Regional Hospital N(%)	Municipal Hospital N(%)
Sex			
Male	76(27.84)	54(29.83)	22(23.91)
Female	197(72.16)	127(70.17)	70(76.09)
Age Group (years)			
25-34 years	133(48.72)	74(40.88)	59(64.13)
35-44 years	105(38.46)	81(44.75)	24(26.09)
45 years and above	35(12.82)	26(14.36)	9(9.78)
Highest Educational Level			
Up to secondary	40(14.65)	30(16.57)	10(10.9)
Certificate/Diploma	144(52.75)	88(48.62)	56(60.9)
Degree*	89(32.60)	63(34.81)	26(28.3)
Department			
Medical	79(28.94)	45(24.86)	34(36.96)
Surgery	57(20.88)	41(22.65)	16(17.39)
Pediatric	51(18.68)	33(18.23)	18(19.57)
Laboratory	17(6.23)	12(6.63)	5(5.43)
Obstetrics & Gynecology	42(15.438)	28(15.47)	14(15.22)
A & E	27(9.89)	22(12.15)	5(5.43)
Profession			
Doctor/Physician Assistant	18(6.59)	13(7.18)	5(5.43)
Nurse/Midwife/Health Assistant	204(74.73)	131(72.38)	73(79.35)
Lab Scientist/Technician	11(4.03)	7(3.87)	4(4.35)
Housekeeping staff	40(14.65)	30(16.57)	10(10.87)
Years of Service/Practice			
1-5 years	89(32.60)	52(28.73)	37(40.22)
5-8 years	83(30.40)	57(31.49)	26(28.26)
8-12 years	58(21.25)	42(23.20)	16(17.39)
13 + years	43(15.75)	30(16.57)	13(14.13)

* First degree, second degree, specialist, etc.

4.2 Outcome of Interest

4.2.1 Proportion of healthcare workers practicing HBV infection prevention measures (adhered to standard precautionary measure) in Ho municipality.

Table 4.2 shows the results of the observational checklist that was used to measure the hepatitis B virus prevention practices. It was observed that only 25.27% of participants had observed hand hygiene practices between patient care, 66.30% use appropriate gloves when anticipating exposure to blood and bodily fluid, 71.43% practice recapping of needles after use, 13.55% use PPE appropriately during patient care, and 41.76% segregate waste immediately after generating. However, the overall practice of HBV infection prevention practice among the health care workers was poor as only 16.12% score good practice and 83.88% had poor practices.

Table 4.2: Observed HBV infection prevention practices (adhered to standard precautionary measures) of health care workers in Ho municipality (N = 273)

Statements	Yes N(%)	No N(%)
Practice hand hygiene measures between patient care	69(25.27)	204(74.73)
Wear appropriate gloves when anticipating exposure to blood and bodily fluid	181(66.30)	92(33.70)
Practice recapping of needles after use	195(71.43)	78(28.57)
Discard needles and sharps immediately after used	132(48.35)	141(51.65)
Appropriate use of other PPE (goggle, surgical mask, aprons, gowns, and boots) during patient/housekeeping activities.	37(13.55)	236(86.45)
Immediate segregation of waste	114(41.76)	159(58.24)

4.2.2 Proportion of healthcare workers vaccinated against HBV infection.

Majority 250(91.58%) of HCW were screened for hepatitis B virus infection and 228(83.52%) were vaccinated against hepatitis B. Out of those vaccinated, majority, 76% had received three doses of the vaccine (see figure 4.1). Those who had not completed vaccination were asked to give reasons for not completing vaccination. More than half 54.8% indicated that they are yet to complete the vaccination schedule, 31.0% forgot the date hence miss the dose, 7.1% indicated that it is for 'no reasons' and 7.1% stated they got pregnant and have to stop vaccination schedule.

Table 4.3: Healthcare workers HBV infection vaccination information

Variables	Frequency	Percentage
Testing/screening status for hepatitis B		
Yes	250	91.60
No	23	8.40
Vaccination status for HBV infection		
Yes	228	83.50
No	45	16.50
Reasons for not being vaccinated		
No reason/Not necessary	20	44.40
Vaccine not available	7	15.60
Vaccine expensive/no money	8	17.80
Lactating	2	4.40
Natural immunity from the previous infection	6	13.30
Yet to start the vaccination	2	4.40
Have you completed your vaccination		
Yes	186	81.60
No	42	18.40
Reasons for not completing vaccination		
Yet to complete	23	54.80
Forgot/miss the dose	13	31.00
No reason	3	7.10
Pregnant	3	7.10

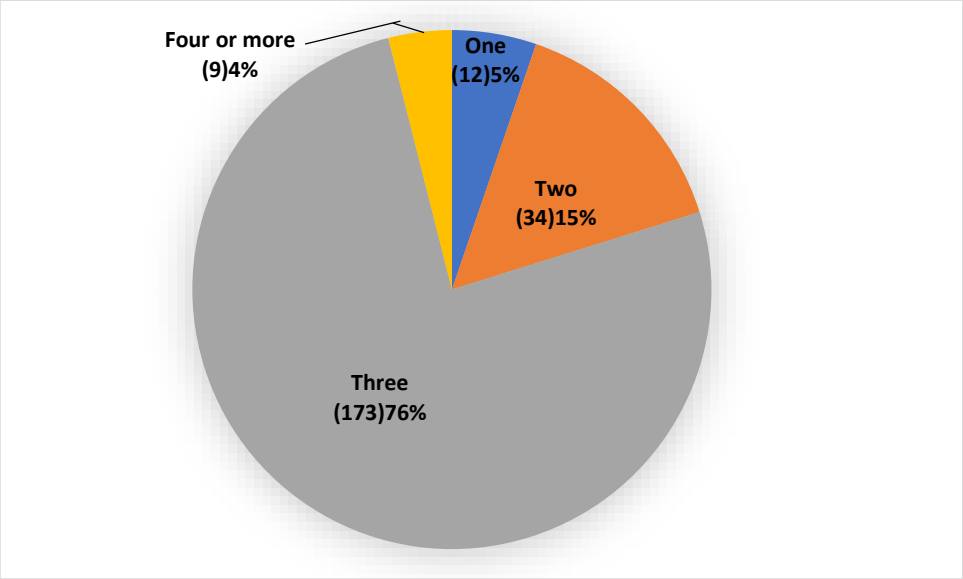

Figure 4.1: Number of Hepatitis B virus infection vaccines received by health care workers in Ho Municipality

4.3 Availability of infection prevention and control logistics on the ward (department)

The majority (85.35%) of participants indicated that PPE were always available for use on the ward. Almost all (97.8%) participants indicated that hand hygiene facility was always available and 72.16% indicated that dustbin liners were at all times available in the department for use. (see Table 4.4).

Table 4.4: Availability of IPC logistics on the ward (departments)

Variables	Percentage
Availability of PPE*	
Sometimes	14.65
Always	85.35
Availability of hand hygiene facility[a]	
Sometimes	2.20
Always	97.80
Availability of bin liners[b]	
Sometimes	27.84
Always	72.16

PPE* means gloves, goggles, surgical masks, aprons, gowns, and boots.
facility [a] means running water, soap, hand drying material, alcohol rub.
liners [b] yellow, black and brown dustbin liners. PPE; Personal protective equipment

4.4 Health care workers' knowledge level on HBV infection and its preventive measures in Ho Municipality.

The knowledge score for knowledge of hepatitis B among the health care workers ranges from 9 to 22 with a mean score of 17.55 and a standard deviation ±2.14. With respect to knowledge on HBV infection, participants were interviewed on general knowledge on HBV infection, knowledge on route and mode of transmission, knowledge on sequel and knowledge on prevention. With respect to general knowledge on hepatitis B, 95.6% of study participants knew that the causative agent for HB was a virus. However, with respect to how long the virus can survive outside the body, only 16.85% had the correct answer. With knowledge on the route of transmission of HBV, 90.11% knew HB can be spread by having unprotected sexual intercourse and contact with open wounds/cuts, and 54.95% knew HB cannot be spread through casual contact such as a handshake. With knowledge on the mode of HB transmission, almost all, 95.6%, of the participants knew that HBV can be transmitted through contact to blood and body fluids. With knowledge on the sequel on HB, only 39.93% knew hepatitis B disease is not curable, however, 88.28% knew it can

kill infected persons. With regards to knowledge on prevention of HBV transmission, 45.05% knew PEP was available for HBV and 97.44% of participants are aware of vaccine for prevention of HBV infection transmission (see Table 4.5). Overall, 69.6% of participants had good knowledge of Hepatitis B and its prevention measures whereas 29.3% had moderate knowledge and 1.1% had poor knowledge (see Figure 4.2).

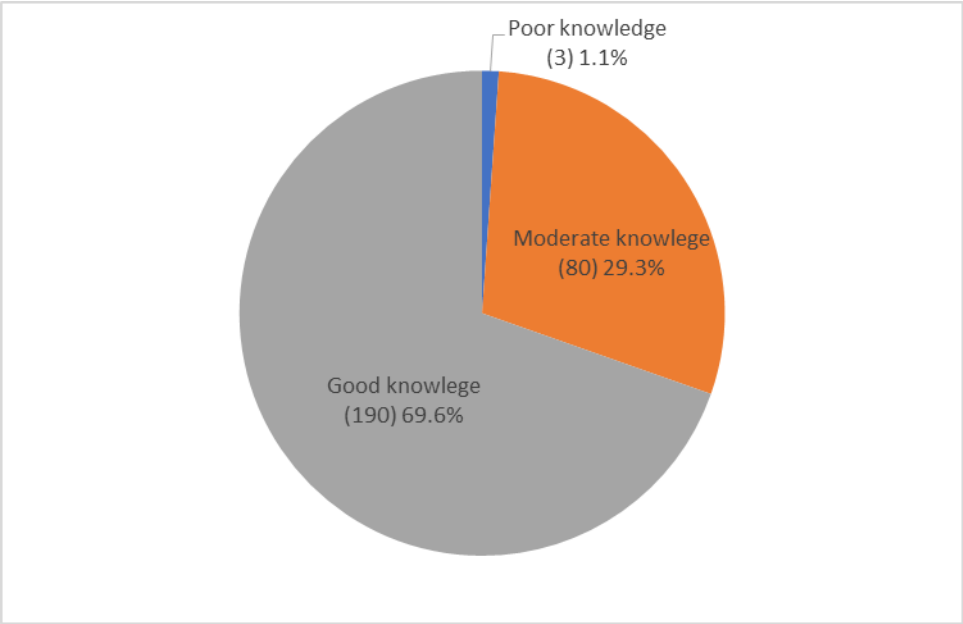

Figure 4.2: Level of knowledge of hepatitis B virus infection and prevention among health workers in Ho Municipality

Table 4.5: Knowledge of health care workers on hepatitis B virus infection and preventive measures in Ho municipality (n = 273)

Question	Correct response N(%)	Incorrect response N(%)
General knowledge of hepatitis B		
Hepatitis B disease is caused by	261(95.60)	12(4.40)
Can an infected person who look and feel healthy spread hepatitis B infection	251(91.94)	22(8.06)
HBV can survive outside the body for how many days	46(16.85)	227(83.15)
HBV disease is 50 to 100 times more easily spread from person to person than HIV/AIDS	191(69.96)	82(30.04)
Are HCW at increased risk of getting infected with HBV disease	250(91.58)	23(8.42)
A person can be infected with hepatitis B and not have any symptoms of the disease	239(87.55)	34(12.45)
Knowledge on the route of Transmission		
HB disease can be spread by having unprotected sexual intercourse with an infected person	246 (90.11)	27(9.89)
HBV disease can be transmitted by infected sharps/needles stick injury	245 (89.74)	28(10.26)
HBV disease can be transmitted through blood transfusion	261 (95.60)	12(4.40)
HBV disease can be spread by casual contact such as handshaking	150 (54.95)	123(45.05)
HBV disease can be spread by contact with open wounds/cut	245 (90.11)	28(9.89)
Knowledge on the mode of transmission		
Can HBV be transmitted through contaminated blood and body fluids	261 (95.60)	12(4.40)
Can HBV be transmitted through unsterilized syringes, needles, and surgical instruments	253 (92.67)	20(7.33)
Knowledge about sequel		
Can infected persons with HBV remain infected for life	137 (50.18)	136(49.82)
HBV can lead to cirrhosis of the liver and liver cancer	234 (85.71)	39(14.29)
Is Hepatitis B disease curable	109 (39.93)	164(60.07)
HBV disease can kill infected person	241 (88.28)	32(11.72)
Knowledge about prevention		
There is a vaccine for hepatitis B	266 (97.44)	7(2.56)
Do you think hepatitis B transmission from one person to the other can be prevented by HBV vaccine	244 (89.38)	29(10.62)
Can observing standard precautions during health care worker-patient interaction can prevent HBV infection	268 (98.17)	5(1.83)
Is there post-exposure prophylaxis availability for HBV	123 (45.05)	150(54.95)
Can one be tested (laboratory) and vaccinated against HBV infection	268 (98.17)	5(1.83)

4.5 Pearson chi-square test of association of determinants of Healthcare workers knowledge on Hepatitis B Infection and Prevention in Ho municipality

Participants' educational level and profession were the two statistically significant determinants of knowledge on HBV infection prevention. Table 4.6 shows bivariate analyses of healthcare workers' knowledge of HBV infection prevention. The number of years of practice, Age group, department and sex of health care workers were however not related to the knowledge on HBV infection prevention.

Table 4.6: Pearson chi-square test of association of determinants of Healthcare workers knowledge on Hepatitis B Infection and Prevention in Ho municipality

Variables	Moderate Knowledge[a] n(%)	Good Knowledge n(%)	Total	Chi-square (χ^2)	P-value
Age group (years)					
Less than 34 years	38(28.57)	95(71.43)	133(48.72)	4.4733	0.115
35-44 years	29(27.62)	76(72.38)	105(38.46)		
45 years and above	16(45.71)	19(54.29)	35(12.82)		
Sex					
Male	17(22.37)	59(77.63)	76(27.84)	3.2131	0.080
Female	66(33.50)	131(66.50)	197(72.16)		
Educational Level					
Up to secondary	38(95.00)	2(5.00)	40(14.65)	95.7152	**<0.001***
Certificate/Diploma	34(23.61)	110(76.39)	144(52.75)		
Degree	11(12.36)	78(87.64)	89(32.60)		
Profession					
Medical Officers/Physician Assistants	0(0.00)	18(100.00)	18(6.59)	110.253	**<0.001***
Nurses and Midwives	37(19.27)	155(80.73)	192(70.33)		
Health Assistants	8(66.67)	4(33.33)	12(4.40)		
Lab scientists/technicians	0(0.00)	11(100.00)	11(4.03)		
Housekeeping staff	38(95.00)	2(5.00)	40(14.65)		
Department					
Medical	20(25.32)	59(74.68)	79(28.94)	7.6435	0.193*
Surgery	18(31.58)	39(68.42)	57(20.88)		
Paediatrics	22(43.14)	29(56.86)	51(18.68)		
Laboratory	3(17.65)	14(82.35)	17(6.23)		
Obstetrics and Gynaecology	10(23.81)	32(76.19)	27(9.89)		
Accident and Emergency	10(37.04)	17(62.96)	27(9.80)		
Years of Practice					
Less than 5 years	31(34.83)	58(65.17)	89(32.60)	2.672	0.439*
5-8 years	25(30.12)	58(69.88)	83(30.40)		
9-12 years	13(22.41)	45(77.59)	58(21.25)		
13 years and above	14(32.56)	29(67.44)	43(15.75)		

***represent p-value from fisher's exact, p-value bolden is statistically significant, moderate knowledge[a] represent moderate knowledge contained 3 participants with poor Knowledge

4.6 Pearson chi-square test of association between determinants of interest and outcome of interest

4.6.1: Pearson chi-square test of association of socio-demographic factors and Hepatitis B virus infection prevention practices among health care workers in Ho municipality

All socio-demographic factors were not significantly associated with hepatitis B prevention practices except the department of a health care worker. Pearson Chi-square test was employed to determine the association between socio-demographic factors and healthcare workers' practices relating to HBV infection prevention. Age, sex, profession, years of practices, and educational level were not significant, but department was significantly associated ($p<0.05$) with health care workers practices on hepatitis B prevention with about 20.25% of HCW in medical department and 30.95% in Obstetrics and Gynaecology reporting of good hepatitis B prevention practices (see Table 4.7).

Table 4.7: Pearson chi-square test of association of socio-demographic factors and Hepatitis B virus infection prevention practices among health care workers in Ho municipality

Variable	Poor Practice n(%)	Good Practice n(%)	Total	Chi-square (χ^2)	P-Value
Age group (years)					
25-34 years	108(81.20)	25(18.80)	133(48.72)	4.3539	0.098*
35-44 years	94(89.52)	11(10.48)	105(38.46)		
45 years and above	27(77.14)	8(22.86)	35(12.82)		
Sex					
Male	66(86.84)	10(13.16)	76(27.84)	0.6822	0.467*
Female	163(82.74)	34(17.26)	197(72.16)		
Educational Level					
Up to secondary	34(87.50)	6(12.50)	40(14.65)	0.9375	0.687
Certificate/Diploma	118(81.94)	26(18.06)	144(52.75)		
Degree	76(85.39)	13(14.61)	89(32.60)		
Profession					
Medical Officers/Physician Assistants	17(94.44)	1(5.56)	18(6.59)	5.992	0.269*
Nurses and Midwives	155(80.73)	37(19.27)	192(70.33)		
Health Assistants	12(100.00)	0(0.00)	12(4.40)		
Lab scientists/technicians	10(90.91)	1(9.09)	11(14.60)		
Housekeeping staff	35(87.50)	5(12.50)	40(14.65)		
Department					
Medical	63(79.75)	16(20.25)	79(28.94)	13.5665	**0.026***
Surgery	50(87.72)	7(12.28)	57(20.88)		
Paediatrics	45(88.24)	6(11.76)	51(18.68)		
Laboratory	16(94.12)	1(5.88)	17(6.23)		
Obstetrics and Gynaecology	29(69.05)	13(30.95)	42(15.38)		
Accident and Emergency	26(96.30)	1(3.70)	27(9.89)		
Years of Practice					
Less than 5 years	75(84.27)	14(15.73)	89(32.60)	2.2491	0.511*
5-8 years	67(80.72)	16(19.28)	83(30.40)		
9-12 years	52(89.66)	6(10.34)	58(21.25)		
13 years and above	35(81.40)	8(18.60)	43(15.75)		

* represent Fishers exact p-value, p-value bolden are statistically significant

4.6.2: Pearson chi-square test of association of knowledge and Hepatitis B virus infection prevention practices among health care workers in Ho municipality

Pearson Chi-square test was employed to determine the relationship between knowledge and healthcare workers' practices relating to HBV infection prevention. Knowledge was not statistically significantly associated with hepatitis B prevention practices (p-value > 0.05). See Table 4.8 for details.

Table 4.8: Pearson chi-square test of association of knowledge and Hepatitis B virus infection prevention practices among health care workers in Ho municipality

Variable	Poor Practice n(%)	Good Practice n(%)	Total	Chi-square (χ^2)	P-Value
Knowledge Level					
Moderate Knowledge*	69(83.13)	14(16.87)	83(30.40)	0.0497	0.859
Good knowledge	160(84.21)	30(15.79)	190(69.60)		

Moderate knowledge* represent moderate knowledge of participants plus 3 participants with poor knowledge

4.6.3: Pearson chi-square test of association of availability of logistics and Hepatitis B Prevention Practices among health care workers in Ho municipality

Only the availability of dustbin linings was statistically significant ($p<0.05$) in preventing Hepatitis B among health care workers. Table 4.9 displays bivariate analyses of the availability of logistics and healthcare workers' practices relating to HBV infection prevention. The availability of PPE and hand washing facilities were not associated with Hepatitis B prevention.

Table 4.9: Pearson chi-square test of association of availability of logistics and Hepatitis B Prevention Practices among health care workers in Ho municipality

Variable	Poor Practice n(%)	Good Practice n(%)	Total	Chi-square (χ^2)	P-Value
Availability of PPE					
Always	196(84.12)	37(15.88)	233(85.35)	0.0663	0.817
Sometimes	33(82.50)	7(17.50)	40(14.65)		
Availability of dustbin linings					
Always	158(80.20)	39(19.80)	197(72.16)	7.0874	**0.009**
Sometimes	71(93.42)	6(6.58)	75(27.84)		
Availability of handwashing facilities					
Always	223(83.52)	44(16.48)	267(97.80)	1.1787	0.594*
Sometimes	6(100.00)	0(0.00)	6(2.20)		

* represent Fishers exact p-value, p-value bolden is statistically significant

4.7 Multivariate analysis of the association of determinants of Hepatitis B virus infection Prevention Practices among health care workers in Ho municipality

Logistic regression analysis adjusting for each other, been in the medical department (AOR: 3.18, 95% CI: 1.11-10.08, *p*=0.040) or the obstetric and gynecological department was associated with HBV infection prevention practices (AOR: 3.98, 95% CI: 1.14-13.83, *p*=0.030). Also, always having dustbin linings was also associated with HBV infection prevention practices (AOR: 3.41, 95% CI: 1.09-10.73, *p*=0.036). People in those departments have the tendency to indulge in HBV infection prevention practices compare to those who are not in these departments. For example, being in the medical department or obstetric departments is associated with hepatitis B preventive measures.

Also, the odds of practicing Hepatitis B preventive measures was about 4 times more among participants in the obstetric and gynecological department compared to those in the paediatric department. The odds of practicing Hepatitis B preventive measures when

dustbin linings were always available was 3.4 more compared to non-availability of dustbin linings. Table 4.10 below shows determinants of hepatitis B prevention practices

Table 4.10: Multivariate analysis of the association of determinants of Hepatitis B virus infection Prevention Practices among health care workers in Ho municipality

Variable	COR	95% CI	P-value	AOR	95% CI	P-value
Age group (years)						
Less than 34 years	1.00			1.00		
35-44 years	0.51	0.24-1.08	0.079	0.78	0.29-2.14	0.631
45 years and above	1.28	0.52-3.15	0.591	1.19	0.29-4.82	0.812
Sex						
Male	1.00			1.00		
Female	1.38	0.64-2.95	0.410	0.98	0.39-2.45	0.965
Educational Level						
Degree	1.00			1.00		
Up to secondary	0.84	0.28-2.52	0.750	1.29	0.09-2.17	0.986
Certificate/Diploma	1.29	0.62-2.66	0.494	0.96	0.39-2.37	0.936
Profession						
Housekeeping staff	1.00			1.00		
Medical Officers/Physician Assistants	0.41	0.44-3.81	0.434	9.43	0.24-3.41	0.986
Nurses and Midwives	1.67	0.61-4.56	0.316	3.01	0.31-4.26	0.987
Health Assistants	1.00			1.00		
Lab scientists/technicians	0.70	0.73-6.70	0.757	1.00	0.65-5.13	0.756
Department						
Paediatrics	1.00			1.00		
Medical	1.90	0.69-5.24	0.213	3.18	1.11-10.08	**0.040**
Surgery	1.05	0.33-3.36	0.934	1.24	0.34-4.56	0.745
Laboratory	0.47	0.05-4.19	0.498	1.91	0.01-3.10	0.887
Obstetrics and Gynaecology	3.36	1.15-9.84	**0.027**	3.98	1.14-13.83	**0.030**
Accident and Emergency	0.29	0.03-2.53	0.262	0.91	0.08-10.20	0.940
Years of Practice						
13 years and above	1.00			1.00		
Less than 5 years	0.82	0.31-2.13	0.678	0.59	0.16-2.24	0.439
5-8 years	1.04	0.41-2.68	0.927	1.43	0.42-4.88	0.565
9-12 years	0.50	0.16-1.58	0.241	0.70	0.17-2.95	0.630
Availability of PPE						
Sometimes	1.00			1.00		
Always	0.89	0.37-2.16	0.797	1.33	0.46-3.87	0.598
Availability of dustbin linings						
Sometimes	1.00			1.00		
Always	3.51	1.33-9.27	**0.011**	3.41	1.09-10.73	**0.036**
Knowledge Level						
Moderate Knowledge[a]	1.00			1.00		
Good knowledge	0.92	0.46-1.85	0.824	0.50	0.20-1.30	0.154

p-value bolden is statistically significant, moderate knowledge[a] represent moderate knowledge plus 3 participants with poor knowledge

CHAPTER FIVE

DISCUSSION

5.1 Main Findings

The study involved 273 health workers. It was found that only 16.12% of the health care workers adopted good practices of hepatitis B virus infection prevention. 83.52% stated they were vaccinated, however, only 76% of those vaccinated received all three doses of HBV infection vaccine. Only the department of health care workers (p-value < 0.026) and availability of dustbin linings at all times (AOR: 3.41, 95% CI: 1.09-10.73, *p*=0.036) were associated with the practice of hepatitis B virus infection prevention measures among health care workers. Regarding the availability of infection prevention and control logistics, this study found a high availability of personal protective equipment (85.35%), hand washing facilities (97.8%), and dustbin liners (72.16%). However, only the availability of dustbin lining was statistically associated with the good practice of hepatitis B virus infection prevention measures.

5.2 Methodological validity

Several strengths were identified in this study. The effect of selection bias was minimized because the study population was sampled from the two major hospitals in the municipality with a 100% response rate. Information bias was also minimized as data on outcome was collected objectively with an observational checklist. With the observational checklist, participants were observed whiles performing procedures in the department ten times (on each statement that assess their practice) after which they were rated. This implies that the findings of this study are a true picture reflection of HBV infection prevention practices

among the health care workers in Ho municipal. Despite these strengths, the study also faced some limitations like the use of the self-reported questionnaire to collect data on vaccination status.

5.3 Comparison of my finding with previous studies

The need for the adoption of constant IPC by health care workers is of vital importance in view of the high prevalence rate of HBV in the sub-region and the high frequency of possibly contaminating accidents among health care workers and also in the general population (Okwara et al., 2012).

The outcome of interest of this study is to determine the proportion of health care workers that adhered to hepatitis B virus infection prevention practice. The current study found practices of health care workers towards HBV infection prevention to be poor as 83.88% of health care workers that participated in the study had poor practice towards HBV infection prevention and only 16.12% of them adopted good practice towards Hepatitis B virus infection and prevention. This finding is supported by Oyewusi, (2015) that indicated that 62.4% of the health care workers had poor practices of infection prevention. Abiola, Omoyeni, & Akodu, (2013) also indicated that 84.5%vof health care workers had poor HBV infection prevention practices and IPC practices were low in a study by Gichuhi, Kamau, & Nyangena, (2015). The above findings on prevention practices indicated that adherence to infection prevention practices was low in their survey. However, another study conducted by Olanrewaju et al. (2018) contrasted sharply with a higher proportion of 60.9% health care workers who adopted good practices of prevention of hepatitis B virus infection.

The possible explanations for poor HBV infection prevention practices by health care workers in this study might be due to the high vaccination rate (83.52%) of respondents. Though HBV infection vaccination is the mainstay of reducing the risk of HBV infection, it is however not a replacement for good IPC practice since vaccination is not a hundred percent protective. This indicates the need for more aggressive effort through activities such as in-service training to educate health care workers on HBV infection prevention practices.

Knowledge of hepatitis B virus infection was another area assessed in this study. This was necessary because knowledge and awareness of hepatitis B enable people to make informed decisions to prevent the occurrence and control of the disease (Colvin & Mitchell, 2010; Mesfin & Kibret, 2013). This study found that knowledge of hepatitis B among health workers was quite good as 69% of health care workers had good knowledge of hepatitis B infection and prevention. This is in congruence to the findings of Bakry, Mustafa, Eldalo, & Yousif, (2012); Abiola, Omoyeni, & Akodu, (2013); Afihene et al. (2015); Mehriban et al. (2014), and Ahmed et al., (2016) who reported of inadequate knowledge of health workers regarding hepatitis B. However, unlike these studies, other studies found that health workers knowledge on hepatitis B infection prevention was inadequate with less than 50% of the study participants having poor knowledge on hepatitis B infection prevention (Chao, Chang, & So, 2010; Kabir et al. 2010; Adekanle et al. 2015). Though 69% of health care workers had good knowledge of hepatitis B infection and prevention, is still calls for concern since 31% had inadequate knowledge of hepatitis B infection and prevention. This need to be investigated to ascertain the reasons behind

this poor knowledge. This will help in putting in lasting measures to improve the knowledge level of all health care workers.

Health care workers' health status is crucial in the quality of care delivered. It is however key that attention is given to factors that predisposed health care workers to hepatitis B infection like non-vaccination. It is also very vital for health care workers to get themself screen for hepatitis B virus infection. This will enable them to take hepatitis B vaccines. Hence, the current study assessed screening and vaccination status of health workers against hepatitis B virus infection. It was shown that almost all health workers 91.58% have been screened for hepatitis B. This finding is, however, not in support of the findings by Abdela et al. (2016) and Mehriban et al. (2014). They found that a low proportion of health workers had been screened, 34.3%, and 69.3%, respectively. It is, however, in congruence to the finding of Koria and Lala (2012) that all health workers had been screened for hepatitis B. Also, Hepatitis B vaccination is a major means of reducing risk of occupational infection, and preventing transmission of the infection among health workers (Koria & Lala, 2012: Mehriban et al. 2014: Fortunato, Tafuri, Cozza, Martinelli, & Prato, 2015: Malewezi, Omer, Mwagomba, & Araru, 2017). This study revealed that about 83.52% of the health workers have been vaccinated against hepatitis B. The finding that more than half of the health care workers have been vaccinated against hepatitis B, is in congruence to studies by Ziglam et al. (2013) which found 82.6% of the health workers had been vaccinated against hepatitis B virus infection. Likewise, 69.7% of health workers in a study conducted by Afihene et al. (2015) were found to be vaccinated against hepatitis B. The health workers may have received hepatitis B screening and vaccination from their hospital as part of the policy of the facility. As in this study, more than half of the health

workers indicated that there is an existing policy regarding hepatitis B prevention in their hospital. This study also identified that 76% of health care workers have received three doses of the hepatitis B virus vaccine. These findings (on the number of vaccines taken) were not different from what has been reported by Konlan, Aarah-Bapuah, Kombat, & Wuffele, (2017) in their study which indicated that 75% of participants received three doses of vaccination. However, a relatively lower percentage of the nurses 44.4% were vaccinated.

Even though almost all health care workers were vaccinated, only 76% received the three doses of HBV vaccine. This implied that about 24% were still not fully protected against the infection (HBV). Lack of compliance with hepatitis B vaccination among health care workers calls for concern among stakeholders as effective vaccination is one important way of protecting health care workers from the infection (HBV). For this reason, there is a need to increase the awareness of the health care workers on the importance of HB vaccination through education, and the development of vaccination policies at the hospitals.

Another focus of this study was to identify the determinants of health care workers' practices on hepatitis B virus prevention. Findings from this study showed that knowledge of health care workers on hepatitis B virus infection prevention did not positively impact their practices. This finding was in line with a study by Mehriban et al. (2014) concluded that most of the respondents (nurses) had adequate knowledge 67.3% on hepatitis B virus infection. However, this does not have any influence on their prevention practice 49.3%. Then again, some socio-demographic characteristics such as education and profession were found to be significantly associated with health care workers' knowledge of hepatitis B

prevention. This assertion was supported by a study conducted by Olanrewaju, et al. (2018). It was reported that medical doctors have 8.4 times better knowledge of HBV and its vaccination than other professionals. The finding that the educational level of health workers influenced their knowledge of hepatitis B, corresponds with that of Hajarizadeh, et al. (2015). They found that the education level of health workers was significantly influential on their level of knowledge regarding hepatitis B. This could be due to differences in modules and some educational institutions provide modules for refreshing and acquiring knowledge of hepatitis B. Another study noted that the sex of health workers influenced their knowledge of hepatitis B (Abdela et al. 2017). They explained that female health workers were more likely to have knowledge of hepatitis B. This could be due to the fact that females have higher risk perception and hence, are likely to learn more about infections with the aim of prevention.

The finding that years of service did not influence the practice of infection prevention, was in line with the findings of Olanrewaju et al. (2018) who reported in their study that years of practice were not associated with the practice of prevention of hepatitis B virus infection ($p=0.056$). However, this assertion contradicts that of Sodhi et al. (2013). They note that health workers with more years of experience or practice adhered more to infection prevention practices. This could be due to the fact that health care workers gained experience over the years, their risk perception has reduced. Hence, they no longer perceive the need to adhere to hepatitis B infection prevention practices. Also, the high proportion of vaccination among the respondents of this current study may have made most of the health workers complacent that not engaging in infection prevention practices no longer pose much risk due to their vaccination status. Another study by Mehriban et al.

(2014) in a bivariate analysis showed an association between age and knowledge with the practice of preventive measures of hepatitis B virus infection. This finding was different from findings in this study that indicated no association between age and knowledge with hepatitis B virus prevention practices.

Another focus of this study was to determine factors that influence health care workers' practices on hepatitis B virus infection prevention. Availability of dustbin linings (p=0.009), and department of health care worker (p=0.026) was statistically significant. This assertion was similar to a study by Bakry, Mustafa, Eldalo, & Yousif, (2012) that concluded that availability of infection prevention and control logistics such as PPE, appropriate hand hygiene facilities, and waste disposal bins and liners have been cited as a key determinants of adherence to HBV infection practices. However, I noted that those in the medical department and the obstetric and gyneacological department stand a better chance of practicing hepatitis B prevention measures, than those in the peadiatric department. The investigation needs to be conducted to identify the reason for such good practices in these two departments so as to extend it to the other departments within the facility.

5.4 Conclusion

This study demonstrated that the practice of health care workers in relation to hepatitis B prevention is low despite the knowledge level of the participants with regards to hepatitis B virus infection and prevention. Also, with the exception of the department of health care workers, and availability of dustbins, all other variables of interest were not associated with the practices of health care workers with regards to hepatitis B virus infection prevention practices.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The result of this study indicates that the overall practices of health care workers on HBV infection prevention was poor (16.12%). Almost all health care workers had been vaccinated against HBV infection. It also indicates high availability of dustbin linings (72.16%) always in the facilities, and working in specific departments (medical and obstetrics and Gynaecology) was statistically significant with the practice of hepatitis B prevention among health care workers. Knowledge of hepatitis B was also not found to be statistically associated with the practice of hepatitis B prevention.

Socio-demographic variables that were statistically significant with health care workers' knowledge were educational level and profession. However, there was no statistically significant association between socio-demographic variables (age, sex, educational level, profession and years of practices), and practices of health care workers regarding hepatitis B prevention measures. Finally, the majority of health care workers had been screened and vaccinated against hepatitis B infection.

Finally, this study identified that the practices of health care workers were associated with the availability of dustbin linings. This finding has not been seen in any other study. However, all other results provide outcomes to buttress earlier studies.

6.2 Recommendations

Based on the findings identified in this study, some gaps have been identified and for this reason, the following recommendations were made.

1. The majority of health care workers' practice of Hepatitis B prevention measures was poor, and this is not acceptable due to the vulnerability to health care workers. For this reason, facilities management should ensure line managers supervise staff at work.
2. Even though the majority of Health care workers had good knowledge on HBV infection, there is a need for more periodic educational sessions for health care workers on HBV infection, and prevention of transmission of infection in the hospital settings, to equip those with inadequate knowledge and re-orient those with some knowledge on hepatitis B infection.
3. Deliberate programmes of continuing education and training should be designed for the healthcare workers at the regional and the facility levels, to enhance their knowledge and compliance to prevention measures.
4. Further studies need to be done to identify factors behind poor infection prevention practices of health care workers increase in the municipality.

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APPENDICES

APPENDIX 1: INFORMED CONSENT FORM

Title of study: Health care workers knowledge and practices concerning hepatitis B infection and its prevention in the Ho Municipality, Volta Region, Ghana.

Principal investigator: I am Josephine Atsufi Kporngor, a student at the School of Public Health, Department of Biological, Environmental and Occupational Health Sciences, University of Ghana, Legon. I am a sandwich student.

Mobile number: +233 243477740

You are being invited to take part in a research project which forms part of my Masters' thesis titled "Health care workers knowledge and practices concerning hepatitis B infection and its prevention in the Ho Municipality, Volta Region, Ghana". Please take some time to read the information presented here, which will explain the details of this project. Please ask the researcher any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails, and how you could be involved. Also, your participation is entirely voluntary, and you are at liberty to withdraw your participation. If you say no, this will not affect you in any way. You are also free to withdraw from the study at any point, even after agreeing to participate at any point without fear of paying any penalty or harm. Your decision will be respected.

Aim/purpose of the study: To access healthcare workers' knowledge and practices concerning HBV infection and its prevention in Ho Municipal, Volta Region, Ghana. The

purpose is to know the proportion of health care workers with good knowledge and practices towards hepatitis B prevention and work out possible recommendations.

Procedure: I will be administering questionnaires to you to gather information on, knowledge of HBV infection and its prevention in Ho Municipal, Volta Region, Ghana. Completing the questionnaire will take about thirty (30) minutes and you will also be observed as you work in your natural environment for a period of one week without interruption of work.

Confidentiality and Anonymity: Your responses and information provided during this interview will be strictly confidential. Your name will not be documented on the questionnaire, however, special identity numbers will be given to you. Your name will not be linked to your responses as you will be identified only by a study number or code. Only the principal investigator and supervisor will have access to the information you provide. All recorded questionnaires will be stored in a cabinet under lock and key and destroyed after five years.

Benefits: There will be no direct monetary benefits in this study. However, at the completion of filling the questionnaire and observation, the participant will be given a souvenir. Also, the answer you provide will help add to the knowledge in the area of Hepatitis B and findings from this research is expected to inform sound policy decisions at all level.

Cost/Compensation: There is no direct cost to be incurred in this study. The study will also not provide compensation of any form to the participants.

Potential risks or interruption: This study will pose minimum risk to you (participants). The risk involves will be mainly discomfort associated with answering questions which will take some time to complete and also being in the known of being observed whiles working. Please note that you are not obliged to answer the question you are not comfortable with. In the course of the interview, if you need to keep the questionnaire answer it by the following day, please feel free to inform the researcher so you may be excused.

This study has been reviewed and approved by the Ghana Health Service Ethical and Review Committee. Please should you have any further question, you may contact: Joesphine Atsufi Kporngor (principal investigator) on +233243477740 or via email: phine22003@yahoo.com / jakporngor@st.ug.edu.gh or Dr. Reginald Quansah (supervisor) on 0272620401 or Ms. Hannah Frimpong (Ghana Health Service Ethical Review Committee Administrator) on +233507041223/+233243235225**.**

Declaration by participant

By signing below, I agree to take part in a research study entitled "Health care workers knowledge and practices concerning hepatitis B infection and its prevention in Ho Municipality, Volta Region, Ghana"

I declare that I have read the information above, or the above information has been read to me. I have understood the information therein. I voluntary give my consent to participate in this study and I understand that I can withdraw at any time without any adverse consequences.

_____ _____

Signature/**Thumbprint of participants** **Date**

I certify that the risk and benefits of taking part in this study have been explained to the individual whose signature appears above.

_____ _____

Signature of Principal investigator **Date**

APPENDIX 2: QUESTIONNAIRE

QUESTIONNAIRE ON PRACTICE RELATING TO HEPATITIS B PREVENTION AND ITS DETERMINANTS AMONG HEALTH CARE WORKERS IN HO MUNICIPALITY, GHANA

No……

Instructions: kindly fill in or check (√) in the spaces provided where applicable

SECTION A

Socio-demographic data

1. Name of facility

   1 Volta Regional Hospital ☐

   2 Ho Municipal Hospital ☐

2. Date of birth ____/____/_____ **(dd/mm/yy)**

3. Age (completed years) _____

4. Sex **1** Male ☐ **2** Female ☐

5. Highest level of education

   1 Up to Secondary ☐ **2** Certificate/Diploma ☐ **3** Degree and higher ☐

6. Occupation

   1 Doctors/PA ☐ **2** Nurses/Midwives ☐ **3** Health assistance ☐

   4 Lab scientist/technician ☐ **5** Housekeeping staff ☐

7. Department

   1 Medical ☐ **2** Surgery ☐ **3** Paediatric ☐ **4** Laboratory ☐

   5 O&G ☐ **6** A&E ☐

8. Number of years of practice (work service) **1** >1 and < 5 ☐ **2** 5 – 8 ☐

   3 9 – 12 ☐ **4** 13 – 16 ☐ **5** 17 –20 ☐ **6** > 20 ☐

SECTION B

Health workers knowledge of hepatitis B

9. Hepatitis B disease is caused by **1** Fungus ☐ **2** Bacteria ☐ **3** Virus ☐
10. If someone is infected with hepatitis B but they look and feel healthy, do you think that person can spread hepatitis B? **1** Yes ☐ **2** No ☐
11. HBV can survive outside the body for how many days?

1 Less than 1 day ☐ **2** Up to 7 days ☐ **3** More than 7 days ☐ **4** Don't know ☐

12. Hepatitis B virus disease is 50 to 100 times more easily spread from person to person than HIV/AIDS. **1** Yes ☐ **2** No ☐
13. Health care workers are at an increased risk of getting infected with HBV disease?

1 Yes ☐ **2** No ☐

14. A person can be infected with hepatitis B and not have any symptoms of the disease

1 Yes ☐ **2** No ☐

Knowledge on the route of Transmission

15. Do you know that Hepatitis B disease can be spread by having unprotected sexual intercourse with an infected person? **1** Yes ☐ No ☐ **3** Not sure ☐
16. Hepatitis B disease can be transmitted by infected sharps/needles stick injury?

1 Yes ☐ **2** No ☐ **3** Not sure ☐

17. Do you think that Hepatitis B disease can be transmitted through blood transfusion?

1 Yes ☐ **2** No ☐ **3** Not sure ☐

18. Do you think that Hepatitis B disease can be spread by casual contact such as handshaking? **1** Yes ☐ **2** No ☐ **3** Not sure ☐

19. Do you think that Hepatitis B disease can be spread by contact with open wounds/cut?

1 Yes ☐ **2** No ☐ **3** Not sure ☐

Knowledge on the mode of transmission

20. Do you think that hepatitis B virus can be transmitted by contaminated blood and body fluids? **1** Yes ☐ **2** No ☐ **3** Not sure ☐

21. Do you think hepatitis B virus can be transmitted by unsterilized syringes, needles, and surgical instruments? **1** Yes ☐ **2** No ☐ **3** Not sure ☐

Knowledge about sequel

22. Do you think that infected persons with HBV can remain infected for life?

1 Yes ☐ **2** No ☐ **3** Not sure ☐

23. Hepatitis B virus can lead to cirrhosis of the liver and liver cancer?

1 Yes ☐ **2** No ☐ **3** Not sure ☐

24. Is Hepatitis B disease curable? **1** Yes ☐ **2** No ☐ **3** Not sure ☐

25. Do you think hepatitis B virus disease can kill an infected person?

1 Yes ☐ **2** No ☐ **3** Not sure ☐

Knowledge about prevention

26. There is a vaccine for hepatitis B **1** Yes ☐ **2** No ☐ **3** Not sure ☐

27. Do you think hepatitis B transmission from one person to the other can be prevented by the HBV vaccine? **1** Y☐ **2**☐ **3** Not sure ☐

28. Do you think that observing standard precautions during health care worker-patient interaction can prevent HBV infection? **1** Yes ☐ **2** No ☐ **3** Not sure ☐

29. Do you think that HBV has post-exposure prophylaxis?

1 Yes ☐ **2** No ☐ **3** Not sure ☐

30. Can one be tested (laboratory) and vaccinated against HBV infection?

1 Yes ☐ **2** No ☐ **3** Not sure ☐

SECTION C

Health workers practice towards hepatitis B infection prevention

31. Have you been tested/screen for hepatitis B? **1** Yes ☐ **2** No ☐ **3** Not sure ☐

32. Have you been vaccinated against hepatitis B virus infection? **1** Yes ☐ **2** No ☐

33. If **No** to question 32, why?

_____

_____

_____

If No to question 32 jump to question 37

34. **If Yes to question 32**, have you completed hepatitis B vaccination schedule?

1 Yes ☐ **2** No ☐ **3** Not sure ☐

35. If **No/Not sure to question 34**, why?

_____

_____

_____

36. How many doses of HBV vaccine have you received?

1 Zero ☐ **2** One ☐ **3** Two ☐ **4** Three ☐ **5** Four and more ☐

37. Is there a policy regarding hepatitis B screening and vaccination for staff in your healthcare facility? **1** Yes ☐ **2** No ☐ **3** Not sure ☐

38. Is appropriate PPE always available for use during patient care activity or during housekeeping activities? **1** Yes ☐ **2** No ☐

39. Do you have appropriate hand hygiene facilities always on the unit for use?

    1 Yes ☐ **2** No ☐

40. Do you always have appropriate dustbin liners (yellow, black, brown) available on the ward for waste segregation? 1 Yes ☐ 2 No ☐

41. Reasons or challenges for not practicing hepatitis B prevention measures

    _____

    _____

    _____

OBSERVATIONAL CHECKLIST ON HEALTH WORKER'S PRACTICE CONCERNING PREVENTION OF HEPATITIS B VIRAL INFECTION IN HO MUNICIPALITY

No……

Instructions: kindly fill in or check (√) in the spaces provided where applicable

S No	PRACTICES	1 Always	0 Sometimes
42.	Practice hand hygiene measures between patient care		
43.	Wear appropriate gloves when anticipating exposure to blood and bodily fluid during procedures		
44.	Recap needles after use		
45.	Discard needles and sharps immediately in sharp containers (puncher resistance)		
46.	Appropriate use of other PPE during patient care or housekeeping activities (goggle, surgical mask, aprons, gowns, and boots)		
47.	Immediate segregation of waste		

Observe staff perform at least 10 different procedures on patient/clients before rating

- If staff practice on each practices area is good for all 10 procedures observed, then tick '**Always'**
- If staff practice on any of the statement is not good or not observed, then tick '**Sometimes'**

CHECKLIST FOR ASSESSING FACILITIES FOR HEPATITIS B VIRUS INFECTION PREVENTION IN HO MUNICIPALITY

FOR: WARD/UNIT/FACILITY

NAME OF WARD/UNIT: _____

FACILITY: _____

Instructions: kindly fill in or check (√) in the spaces provided where applicable

S No.	Availability of logistics	Yes	No	Adequate for 1 week
1.	Running water			
2.	Soap			
3.	Clean hand drying material			
4.	Examination gloves			
5.	Sterile gloves			
6.	Utility gloves			
7.	Puncher resistance sharp box			
8.	Hand sanitizer			
9.	Face mask			
10.	Goggles			
11.	Aprons			
12.	Gowns			
13.	Bin liners (black, yellow, & brown)			
14.	Job aid on hand hygiene, wearing and removal of PPE and waste disposal			
15.	Availability of any policy for protection of staff against occupational exposure to HBV			