SCHOOL OF PUBLIC HEALTH

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FACTORS AFFECTING COMPLETION OF HEPATITIS B VACCINATION AMONG HEALTHCARE WORKERS AT KORLE-BU TEACHING HOSPITAL

BY

PATIENCE QUARTEY

(10938017)

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DECLARATION

I, Patience Quartey, hereby declare that, with the exception of specific references that have been duly acknowledged, this submission is my own work for my MSc degree and does not contain any material previously published by another individual or material approved for the presentation of another degree from the university or somewhere else.

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Patience Quartey

(Student)

31/10/2023

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Date

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Dr. Alexander Manu

(Supervisor)

31/10/2023

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Date

DEDICATION

This work is first and foremost dedicated to the Almighty God for giving me strength, wisdom and guidance to undertake this project work. Secondly I dedicate this work to be beloved husband, Mark for his unflinching support, patience and encouragement throughout this programme. I also dedicate this study to my sweet mother for her help in various ways to ensure that I successfully complete this programme. This work is further dedicated to Dr. Philip Amoo for being a strong pillar behind me throughout the course of my study.

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LIST OF ABBREVIATIONS

Anti-HBc - Hepatitis B core antibodies

AOR – Adjusted Odds Ratio

COR – Crude Odds Ratio

DNA - Deoxyribonucleic Acid

HBsAg - Hepatitis B Surface Antigen

HBV - Hepatitis B virus

HCC - Hepatocellular Carcinoma

HCWs - HealthCare Workers

KBTH - Korle-Bu Teaching Hospital

UGHL - University of Ghana Hospital, Legon

WHO - World Health Organization

ABSTRACT

Background

Hepatitis B is a potentially life-threatening liver infection caused by the hepatitis B virus (HBV) and can cause both an acute and chronic infection (World Health Organization, 2016). It is a major global health problem. It can cause chronic infection and puts people at high risk of death from liver cirrhosis and liver cancer (Hepatocellular Carcinoma).

Methodology

The research was conducted among healthcare professionals at the Korle-Bu Teaching Hospital using an observational cross-sectional study methodology. Taro Yamane's method for calculating sample size was employed in obtaining a sample size of 400 but 420 questionnaires were disseminated in total. Pretesting of the questionnaire was done prior to actual data collection in a small sample of 20 people. Using a Microsoft Excel spreadsheet, the data was verified, coded, and recorded. STATA version 17 was then used to clean and evaluate the data.

Results

Of 400 participants interviewed, only 176 (44%) had adequate knowledge about Hepatitis B. Overall, majority of the HCWs, 285 (78.1%) had completed their hepatitis B vaccination whilst a few of them 10 (2.7%) had received only one dose of the vaccine. Among those who were fully vaccinated, only 68 (18.2%) had received their booster doses. Reasons given for non-completion of vaccination were time constraints, financial constraints, forgetfulness of appointment dates and fear of the injection.

Factors which were identified to be significantly associated with the completion of hepatitis B vaccination were age bracket of 25- 29 years which obtained a p-value of 0.005 [AOR: 3.50 (CI: 1.45-8.42)], higher educational level which in this study was postgraduate with a p-value of 0.002 [AOR: 14.78 (CI: 2.73-80.18)] and lastly category of HCWs whereby nurses had the highest+++ completion rate of hepatitis B vaccination and were used as a reference point for comparison.

Conclusion

Completion rate of hepatitis B vaccination among HCWs is quite good at the Korle-Bu Teaching Hospital. This success is attributable to the efforts made by the Public Health Unit of the hospital by way of organizing pre-employment vaccination for newly employed staff as well as a mass hepatitis B screening and vaccination exercise for all staff of the hospital. If these interventions are maintained, the safety of current and future HCWs who would serve in the facility will be ensured.

CHAPTER ONE

1.1 Introduction

Hepatitis B is a potentially life-threatening liver infection caused by the Hepatitis B Virus (HBV) and can cause both an acute and chronic disease (World Health Organization, 2016). It is a major global health problem. It can cause chronic infection and puts people at high risk of death from liver cirrhosis and liver cancer (Hepatocellular Carcinoma). Hepatitis B is mainly transmitted through blood and body fluids such as saliva, menstrual blood, vaginal and seminal fluids contaminated by the Hepatitis B virus (HBV). Other modes of spread include needle stick injury, tattooing, body piercing, reuse of contaminated needles and syringes or sharp objects either in healthcare settings, in communities or among persons who inject drugs. Transmission through sexual intercourse is common especially among unvaccinated people with multiple sexual partners (World Health Organization, 2016). In areas with high infection rates, hepatitis B is also commonly transmitted from mother to child at birth (perinatal transmission) orthrough exposure to infected blood especially from an infected child to an uninfected child duringthe first five years of life. Hepatitis B infection acquired during infancy or childhood before the age of five years is likely to become chronic.

The risk of healthcare workers (HCWs) acquiring hepatitis B infection is 4 times higher than among individuals who do not work in hospitals. Approximately 3 million HCWs out of 35million HCWs globally have occupational exposure to hepatitis B infection each year leading up to 66,000 hepatitis B infections and 261 deaths (Prüss-Üstün et al., 2005). The cycle of transmission of hepatitis B is usually from patients to HCWs and vice versa as well as HCWs to relatives (van Leeuwen et al., 2021).

Globally an estimated 296 million people were reported to be living with chronic hepatitis B infection in 2019 and 1.5 million new infections occur each year. Eight hundred and twenty thousand (820,000) deaths were reported to have occurred in 2019 mostly from complications of hepatitis B infection, principally liver cirrhosis and hepatocellular carcinoma (primary liver cancer). Prevalence of hepatitis B infection varies widely across the WHO regions with the African and Western Pacific regions recording the highest prevalence, 6.1% and 6.2% in the general population respectively (Mahamat et al., 2021).

In Ghana, prevalence of hepatitis B infection has been reported to be in the range of 8%-15% in the urban areas and some parts of rural Ghana, a situation which signifies endemicity of the disease (Botchway et al., 2020). A research conducted in Tamale Teaching Hospital in Ghana revealed that 26.3% of HCWs in that facility were afflicted by the hepatitis B virus (HBV). In this research, nurses were reported to be at higher risk (27%) of acquiring HBV among other categories of HCWs due to their frequent exposure to needle stick injuries and use of sharp objects compared to other categories of staff (Ibrahim, 2019). The prevalence of HBV in Ghana was clarified by a comprehensive analysis done in Ghana that included 21 studies from all ten old regions, with a total sample size of 29,061. According to estimates, the incidence of HBV was as follows for different subpopulations: 8.36% in the adult population, 14.30% in the teenage population, and 0.55% in children under the age of five (pre-school). The set of health care workers known as "the special occupation group" has the greatest incidence of HBV infection among adults. (14.40%) and the lowest prevalence rate of 7.17% was recorded among blood donors.

Compared to the southern region of the nation, prevalence was lower in the northern region. The Ashanti region had the most research (6/21, or 29%), while there were none in the Upper West.

The age range from 20 to 40 years old had the greatest incidence of HBV infection nationwide. This high rate of hepatitis B transmission is alarming and points to a serious public health issue in Ghana. In order to address the problem, a comprehensive public health plan must be developed, and the existing HBV infection control program's implementation flaws must be addressed. By 2030, the nation would have completely eradicated the illness. Hepatitis B illness is however preventable through vaccination which offers about 98% protection against the HBV infection. **Throughout literature, no studies have been discovered on the completion of hepatitis B vaccination among HCWs at the KBTH although numerous studies on hepatitis B had been carried out among HCWs in Ghana. This study therefore seeks to bridge the gap by asking the question ‘’what is the completion rate of Hepatitis B vaccination among HCWs in KBTH.’’**

1.2 Problem Statement

According to WHO estimates, there were 820,000 fatalities and 296 million individuals living with chronic hepatitis B infections in 2019. According to the C.D.C. (2017), a chronic hepatitis B infection raises the chance of acquiring sideeffects such liver cirrhosis and hepatocellular cancer. Hepatitis B illness is the tenth leading cause of mortality globally with 1.5 million new infections each year. It results in 500 000 to 1.2 million deaths per year (WHO, 2018). Management of the virus will pose a substantial economic burden to the country, often without favourable outcomes. According to (Spearman et al., 2017), the risk of hepatitis B infection is four times higher for healthcare workers than it is for the general public. Occupational exposures related to needlestick injuries, contamination with body fluids and continuous contact with patients who could be seropositive are modes of transmission (Butsashviliet al., 2012). **Some of the reasons why HCWs are mostly infected with hepatitis B are the intermittent shortages of Personal**

Protective Equipment (PPEs) such as gloves and goggles which are necessary to prevent direct contact with contaminated blood and body fluids. In another dimension, some HCWs refuse to don these PPEs even when they are available due to negligence and over-confidence and therefore end exposing themselves unnecessarily to the infection. Prolonged exposure to hepatitis B infection even without one's knowledge could lead to complications such as liver cancer (hepatocellular Carcinoma), liver cirrhosis and liver failure. Unlike HCWs, the general population have sexual intercourse as their main mode of transmission of hepatitis B even though exposure to contaminated blood and body fluids are not ruled out. In Ghana, there has been a good number of studies indicating a higher hepatitis B infection rate among healthcare workers (Obiri-Yeboah et al., 2019). It is however worthy of note that HBV is preventable through a three dose vaccination given at 0, 1 and 6 month time points from the start (Hepatitis B foundation 2022). It will further identify barriers to the uptake of hepatitis B vaccination and assess the post vaccination experience of healthcare workers at the Korle-Bu Teaching Hospital, (the largest referral hospital in the country). This will help inform interventions to protect the health workers and use them as agents of advocacy and public education on the disease.

1.3 Justification of the Study

Acquiring hepatitis B infection whilst discharging duties to protect others can be very devastating for HCWs and their families due to the infectious nature of the disease and all the complications that can arise following the infection. Hepatitis B infection is one of the leading causes of death in the general population and HCWs areat four times higher risk of acquiring the infection than the general population. With prevention through vaccination, the complications and possible fatality

can be averted. This study sought to determine the factors that influence completion of hepatitis B vaccination among HCWs at Korle-Bu Teaching Hospital (the largest quaternary and referral hospital in Ghana) to ascertain how protected these HCWs are against acquiring the hepatitis B infection. There are limited studies with regards to hepatitis B vaccination status among HCWs at Korle-Bu Teaching Hospital. Findings from this study therefore will help policy makers and other Stakeholders to implement policies (such as vaccination) that promotes the safety and protection of HCWs. It will also serve as an addition to the body of knowledge.

1.4 Main Objective

To determine the uptake of Hepatitis B vaccination and factors associated with the completion ofvaccination schedule among healthcare workers at the Korle-Bu Teaching Hospital.

1.5 Specific Objectives

1. To assess the knowledge of HBV and Hepatitis B vaccination among healthcare workers in Korle-Bu Teaching Hospital.
2. To estimate Hepatitis B vaccination status among Healthcare workers in Korle-Bu Teaching Hospital.
3. To determine the vaccine completion rate among Healthcare workers in Korle-bu Teaching Hospital
4. To identify the factors influencing healthcare employees at Korle-Bu Teaching Hospital's Hepatitis B vaccination success rate.

1.6 Conceptual Framework

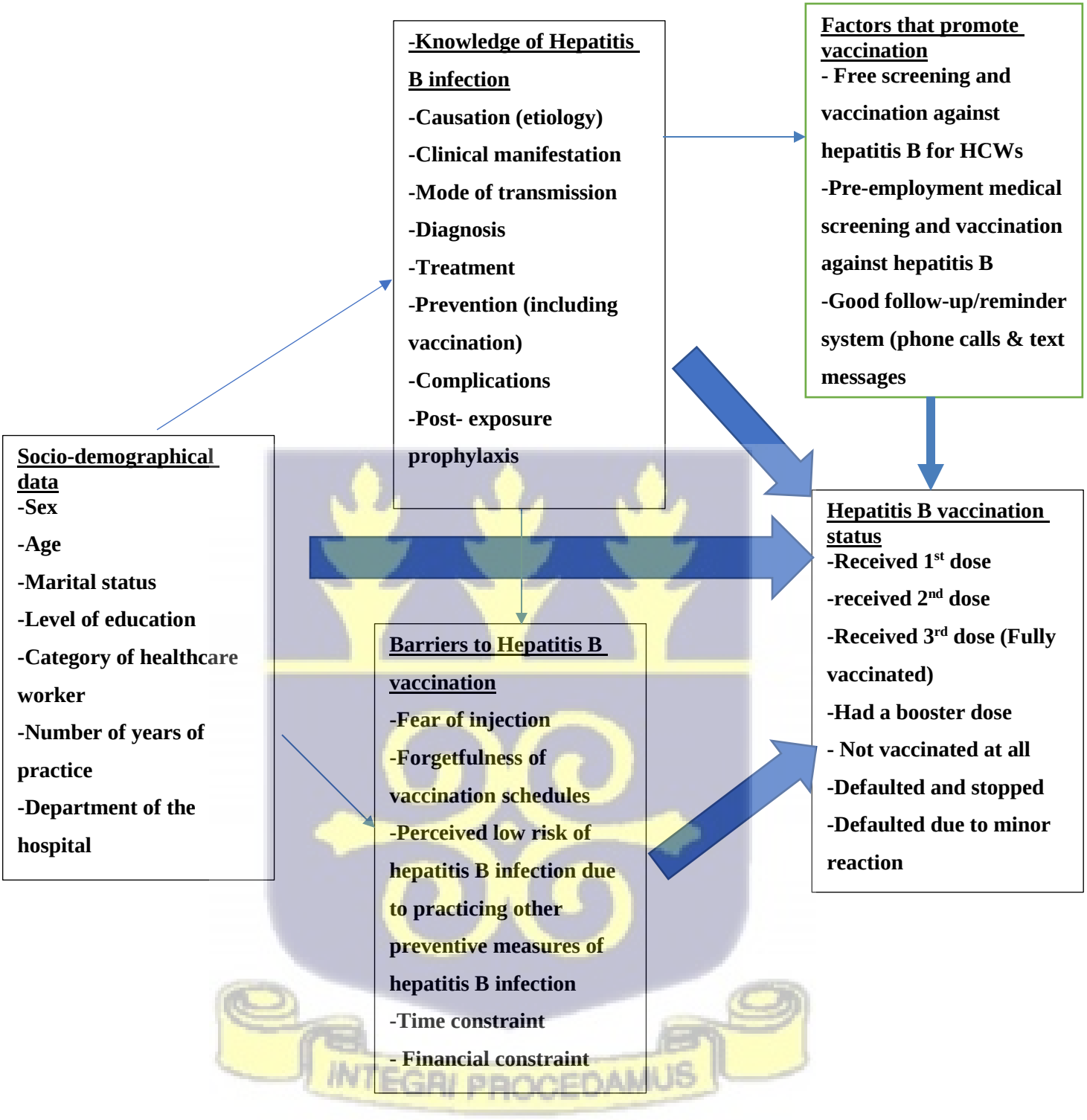

Figure 1: Conceptual Framework

1.7 Narrative Summary

Conceptual framework illustrates the inter-connectedness between the socio-demographical characteristics, knowledge base and barriers to vaccination among HCW and their hepatitis B vaccination status. The level of education (diploma, bachelor's degree, masters' degree etc.) had a direct influence on the knowledge base of the HCWs. Similarly, the category of HCWs (nurse, doctor, laboratory technician etc.) and the number of years in service had a direct bearing on their hepatitis B vaccination status. Interestingly, characteristics such as age, sex and marital status of healthcare professional were directly linked to their hepatitis B vaccination status. Despite having knowledge about hepatitis B, certain barriers such as fear of injection, time constraint, financial constraint, forgetfulness etc. militated against vaccination against hepatitis B among HCWs. Contrary to these barriers, certain factors such as recommendation of Hepatitis B vaccination by friends and colleagues, a good follow -up/reminder system through telephone calls and text messages enhanced the completion of hepatitis B vaccination among HCWs. Consequently, all the variables discussed in the conceptual framework were closely related to each other with their ultimate goal being the completion of hepatitis B vaccination.

This interaction ultimately culminates in desirable hepatitis B infection prevention outcomes that safeguards healthcare workers in their line of duty.

CHAPTER TWO

LITERATURE REVIEW

2.1 Epidemiology of Hepatitis B

Dr. Baruch Blumberg identified the hepatitis B virus in 1965 and was awarded the Nobel Prize for his work. The DNA virus known as the hepatitis B virus (HBV) is a member of the Hepadnaviridae family. It has a tiny viral genome and a partly double-stranded DNA virus. (3.2 kb). Chronic HBV infection is still an issue for worldwide public health. Chronic HBV infection can lead to end-stage liver disease like liver cirrhosis and hepatocellular cancer if ignored. (HCC). Huge strides have been made in HBV fundamental and clinical research in recent years, covering everything from the biological traits of HBV, immunopathogenesis, and animal models to the creation of new therapeutic approaches and novel medicines to combat HBV (Hepatitis B Foundation, 2021).

2.2 Knowledge of hepatitis B infection and vaccination among HCWs

Healthcare professionals, such as nurses and doctors and other paramedics are more likely to contract HBV. Adequate understanding of an illness is required to make efforts toward its avoidance and, later, its effects or sequelae. A number of studies have been carried out globally to determine the level of information held by HCWs regarding the vaccination and other methods of preventing hepatitis B transmission. One of these surveys was carried out in two public maternity hospitals in the Sudanese state of Khartoum, and the results showed that most nurses and midwives (58.2%) in those facilities had an average level of knowledge, two-thirds of respondents used safe practices, and the majority of respondents were in favor of HBV preventive measures (Mursy & Mohamed, 2019). According to participant answers from a research conducted in Freetown, Sierra Leone, 77.3% of HCWs were unaware of the clinical consequences of HBV infection, and 63 (29.9%) and 93 (44.1%) had inadequate understanding of the disease's transmission mechanisms

and preventive measures. The survey also showed that doctors had more awareness of the effects of HBV infection and that professional experience was linked with higher understanding of HBV preventive measures (p = 0.017) (Qin et al., 2018). In a different research conducted in Cameroon by Akazong, and colleagues, the majority of the HCWs (84.9%) had heard of HBV and 67.6% had sufficient understanding of the method of HBV transmission. With 76.5% of all answers, it was found that physicians had the highest level of expertise among healthcare professionals and students (Akazong et al., 2020). In a research done in Afghanistan, it was discovered that 86.5% of HCWs had a solid knowledgebase, with higher education levels having more information than lower education levels. As a result, 34.7% and 61.2%, respectively, of HCWs were found to have a mindset toward the hepatitis B vaccination. In this research, the majority of subjects had insufficient attitudes toward HBV prevention (53.98%) (Roien et al., 2021).

According to a research performed in Lagos State, Nigeria, the majority (70.2%) of the participants had excellent understanding of hepatitis B infection and vaccination (Omoyeni et al., 2013). The majority (90.4%) were aware that a needle puncture injury can spread the hepatitis B infection. Most people (67.9%) were aware that there is a vaccine that can protect against hepatitis B infection, but only 45.1% accurately identified the requirement for a post-vaccination test to prove immunity. The majority (86.9%) were aware that the hepatitis B vaccine is 95% successful when given in its entirety, but only 49.4% were aware of how long the vaccine offers protection. Only 36.9% of people accurately identified the fact that the hepatitis B infection is 100 times more contagious than HIV (Okwara et al., 2012) found that participants in their study at a university teaching hospital in Nigeria were generally (94%, 159) aware that HBV is a viral infection, while

77% (127) and 72.1% (119) agreed that HBV is transmitted through blood transfusion and needlestick injuries. Participants with tertiary education had more accurate knowledge (OR 2.7; 95%CI 1.2-6.3 and OR 2.3; 95%CI 1.0-5.1, respectively). The laboratory employees had more understanding of the sexual mode of Hepatitis B infection, even though 49.1% (80) were conscious that unprotected sex was a route of transmission. Only 114 people (67.5%) regularly follow safety protocols. Only 48 (29.78% of all respondents) of the eighty-six (54.8%) who had gotten the vaccine had finished all three (3) doses; this was more likely among those with higher education (OR 2.6; 95%CI 1.2-5.8). According to a survey conducted at Tamale Central Hospital in Ghana, the majority (59.6%) of HCWs had high awareness of hepatitis B, 36.4% had intermediate knowledge, and 4.0% had poor knowledge. Age, sex, educational attainment, nursing specialization, and length of nursing practice were all related to hepatitis awareness level (Rauf Alhassan, 2021).

According to a study among Ghanaian public health students that was referenced by Osei et al., all of the subjects (262) who were selected for the study were aware of hepatitis B illness and the existence of a vaccine to avoid it. A large percentage of participants (62.2%) identified vaccination as a measure for preventing hepatitis B infection, and the majority (92.7%) of respondents knew the organism that causes hepatitis B infection as well as the mode of transmission (71.0%) (Osei et al., 2019).

2.3 Hepatitis B vaccination status among HCWs

A point-prevalence study at Linkoping University Hospital in Sweden found that while 79% of HCWs (293/369) reported receiving at least one dosage of the vaccine, only 40% (147/369) said they were completely vaccinated and 21% (76/369) said they had not received any vaccinations.

The bulk of unprotected HCWs (72/76, 95%) stated that they would be open to receiving vaccinations if given the chance. The primary obstacle to improved conformance was determined to be the employer's failure to ensure that policies are enacted, not the HCWs' lack of approval (Dannetun et al., 2006).

Another research conducted in Bangladesh showed that 66.6% of HCWs had gotten the hepatitis B vaccine overall. Only 41.1% of secretarial employees and 38.8% of orderlies or temporary workers were found to have received the hepatitis B immunization, compared to more than 75% of physicians and nurses. A blood test for HBsAg was performed on nearly two-thirds (65.0%) ofsubjects to check for hepatitis B cases. Only 53.5% of HCWs had undergone a blood screening and been immunized against hepatitis B. The majority of employees who weren't immunized (89.2%) wanted free vaccinations in the future (Harun et al., 2023).

Auta et al., (2018) systematic review and meta-analysis found that 35 papers from 15 African nations satisfied the inclusion requirements and were included in the study out of the 331 articles they had found. The predicted coverage rate for hepatitis B vaccinations was 24.7% (95% CI: 17.3- 32). In terms of regional distribution, northern Africa had the greatest rate (62.1%, 95% CI: 42.5- 81.7) and central Africa had the lowest rate (13.4%, 95% CI: 4.5-22.3). With projected pooled estimates of 52.4% (95% CI: 31.1-73.8) and 26.3% (95% CI: 9.7-42.9), respectively, doctors were found to be more likely (OR: 2.6, 95% CI: 1.8-3.7) to be completely vaccinated than nurses. Additionally, HCWs with 10 years of experience or more had a higher likelihood of receiving vaccinations than those with less than 10 years of experience (OR: 2.2, 95% CI: 1.5-3.3). The most frequent excuses given for HCWs not receiving vaccinations were expense of immunization (18.4%; 95% CI: 7.1-29.7), busy work schedules (37.5%; 95% CI: 12.6-62.4), and lack of vaccine availabity (50.5%).

2.3 Completion of Hepatitis B vaccination among HCWs

According to a research by (Ngum et al., 2021) at the Bamenda Health District, out of the 280 respondents questioned, 39 (13.9%) had received all recommended vaccinations with the bulk of participants 241 (86%) having received only partial or no vaccinations. Hepatitis B vaccination coverage was 78.1% total. Furthermore, only 72% of HCWs reported being completely immunized despite 82.6% of them having gotten only one dose of the vaccine. Hepatitis B surface antigen (HBsAg) incidence was 1.1% and Hepatitis B core antibody (anti-HBc) incidence was 17.3% on average.

According to (Ogoina et al., 2014), 185 (64.5%) of the 290 HCWs who participated in the research had gotten at least one dose of the hepatitis B vaccine: 105 (36.2%) had full coverage of all the three doses; and 102 (35.5%) had never received any dose of the HBV vaccine. The study was conducted in two teaching hospitals in Nigeria. Hepatitis B vaccination has been linked to professional group and prior education in infection management. In comparison to resident physicians, specialist doctors, and nurses with more work experience, it was realized that house officers, laboratory scientists, and novice groups of nurses were found to have the lowest immunization status.

According to a study by (Ansa et al., 2019) only 53% of healthcare staff at the University of Ghana Hospital in Legon had received the hepatitis B vaccine, which is below the WHO recommendation for all groups at risk, comprising of HCWs who are exposed to patients or their bodily fluids. This shows that roughly 50% of HCWs who are exposed to patients and/or their bodily fluids lack immunity to Hepatitis B and are therefore at risk of contracting the disease if they are exposed to people who are actively spreading it. The lack of strict measures to guarantee

that freshly hired HCWs are completely immunized prior to their assumption of employment at the facility may be the cause of the poor coverage noted. Employees in Ghana's state health institutions, including UGHL, are not required to undergo Hepatitis B virus testing or vaccinations against the disease. Therefore, HCWs who believe they are at risk of contracting an infection and are prepared to cover the associated costs may assume accountability for getting inoculated.

One hundred and ninety-eight (198) representing (56.9%) of the 348 HCWs who were questioned had gotten at least one dose of the hepatitis B vaccine, but only 117 (33.6%) were completely vaccinated. Forty-nine point four percent (49.4%) of the 81 HCWs who had only received partial immunization did not receive their following shots. Fourteen (14) indicating (9.3%) of the unvaccinated HCWs were found to have HBV infection or to have antibodies against HBV infection during pre-vaccination screening. The remaining subjects, however, were unvaccinated and unaware of their HBV immunity status (Aaron et al., 2017). Based on a study by (Rauf Alhassan, 2021) among nurses at Tamale Central Hospital, 77.3% of the respondents had received a full course of hepatitis B vaccination (at least three doses), compared to 2.5% who had only received one dose, 5.1% who had received two doses, and 15.2% who had never received the vaccination.

This indicates that while 84.8% of nurses began their hepatitis B immunization, only 77.3% of respondents received at least three shots. It's also noteworthy to observe that married people had proportionally greater vaccination completion rates than unmarried people. In their research, (Okwara et al., 2012) found that only 48 (29.78%) of the 86 (54.8%) HCWs had gotten all three (3) doses of the hepatitis B vaccine, with higher odds among those with tertiary education (OR 2.6; 95%CI 1.2-5.8). In their study on hepatitis B awareness and vaccination uptake in Africa,

(Shah et al., 2020) found that nurses had the same vaccination rate as people in the other occupations (61% versus 61%), while laboratory personnel had a significantly lower rate of vaccination (49% versus 62% of the population). According to studies done for each individual country, Kenya had the greatest vaccination rate (93%) and Madagascar had the lowest (15%). Surprisingly, regional research revealed that the vaccination rate in West African nations was lower than that in East African nations (52% versus 60%).

In an investigation by (Son et al., 2021) it was found that only 40% of recently hired doctors and nurses had finished their vaccination against hepatitis B infection. Some of their excuses for non-compliance included "they were busy (77%), the vaccination process was complicated (68%), and they just forgot about vaccination (55%). Healthcare professionals frequently requested updates on vaccine regulations and vaccination rate tracking.

2.4 Factors associated with completion of hepatitis B vaccination among HCWs

As per a research done in two clinics in Pakistan, HCWs cited the need for full hepatitis B vaccination for work entry as the main justification. HCWs who had gotten the immunization prior to working at the Aga Khan Hospital in Karachi were four times more protected against hepatitis B transmission than their unvaccinated peers (Soomar et al., 2021). In a cross-sectional research conducted in five developing nations (Afghanistan, Haiti, Malawi, Nepal, and Senegal), 69.1%, 11.3%, 15.4%, 46.5%, and 17.6% of HCWs respectively got the recommended doses of the hepatitis B vaccine. Among HCWs, it was discovered that getting the necessary doses of hepatitis B vaccination was directly correlated with gender, job qualification, and years of schooling (Duodu et al., 2022). A different research carried out in a health facility in Addis Ababa found that factors such as monthly salary, religion, age, working unit, and educational level had a substantial impact on whether or not hepatitis B vaccination was completed (Hordofa

& Hassan, 2021). In their research in Puntland, Somalia, (Hussein et al., 2022) discovered that the uptake of the hepatitis B immunization differs by employment and age range. Midwives and people under age 30 had substantially greater vaccination rates than other groups. In a study conducted in the Democratic Republic of the Congo, (Sikakulya et al., 2022) found that prior testing for the hepatitis B virus (OR: 9.03 (2.51-38.61), P<.0001), prior knowledge of the importance of post-exposure prophylaxis (OR: 12.9 (2.89-80.44), P=0.0004), previous exposure to hepatitis B infection (AOR: 2.61 (1.08-6.39), P=0.039) and previous awareness of the advantages of the hepatitis B vaccine (AOR: 4.54 (1.66-13.05), P=0.002) were factors associated with the full vaccination against the hepatitis B virus among HCWs. Hepatitis B vaccine uptake was still correlated with subject group, age, sex, employment history, and vaccine advice. Compared to those in administrative positions, doctors and nurses were more likely to receive a hepatitis B vaccination (AOR: 6.83, 95% CI: 4.72 -9.89). Older HCWs had a lower chance of receiving the hepatitis B immunization. Both immunization status and hepatitis B vaccination coverage rates were unaffected by and unrelated to gender. In the UOR, the odds ratio for female HCWs getting the hepatitis B immunization was 1.06 (95% CI: 0.81-1.40), which was statistically significant. HCWs who had recently started their careers (5 years of work experience) were 36% more likely to be unvaccinated compared to HCWs who had worked for more than ten years (AOR: 0.64, 95% CI: 0.43-0.95, p-value 0.026). Ansa et al., (2019) discovered that working for more than 16 years (OR: 3.8, CI: 1.02-12.72), daily exposure to sharp objects (OR: 4.1, CI: 1.43-11.81) and blood (OR: 4.45, CI: 1.39- 14.24), daily invasive procedures (OR: 3.0, CI: 1.07-8.45), and frequent exposure to body secretions were all linked to receiving a hepatitis B vaccination.

This literature review aimed at collecting relevant and timely research on my topic to harmonize them into a closely-knit summary of existing knowledge in the field. It was also meant to identify gaps that existed in literature and recommended the need for additional research. Finally, this literature review was conducted to broaden my knowledge base on my chosen research topic. A narrative literature review was employed to evaluate the information and summarize it to draw conclusions about the topic and identify aps or inconsistencies in the body of knowledge. Boolean operators and key words were employed to facilitate the seeking of information on various search engines on the topic under investigation. Databases used for literature review were Science Direct, Scopus, Google Scholar and google.

CHAPTER THREE

METHODOLOGY

3.1 Study Design

The study was done by using an **analytic** cross-sectional design which enabled me to measure the outcome and the exposures in the study participants at the same time.

3.2 Study Site

The research was conducted at Korle-Bu Teaching Hospital (KBTH), which was founded on October 9, 1923 by Sir Gordon Guggisberg, then administrator of the Gold Coast. It is a state teaching hospital in Ghana's Greater Accra region, situated in the Ablekuma Metropolitan District. It is the only state tertiary hospital in the country's south. It is a teaching facility associated with the University of Ghana Medical School (UGMS) and is home to three center of excellence: The National Cardiothoracic Centre, the National Plastic and Reconstructive Surgery Department, and the Radiotherapy Centre. The facility fulfilled the prerequisite in 2019 and was granted a license by the Health Facilities Regulatory Agency (HeFRA). With 2,000 beds, it is presently the third-largest hospital in Africa and the most important state referral center in Ghana.

3.3 Study Population

Doctors, nurses, and other full-time staff of the KBTH who work in healthcare participated in the research. Before any data was collected, all participants were requested to give their written informed consent to take part in the research. KBTH employs 7,328 full-time healthcare professionals in total, made up of 656 physicians, 3502 nurses, 679 laboratory technicians, biomedical scientists, and radiographers, and 2,491 other paramedical professionals such as pharmacists and administrative and support staff.

3.4 Inclusion Criteria

All permanently employed HCWs at KBTH who work at the clinical or patient care areas. The age range of study participants was between 22years to 59years. Informed consent of the participants were sort before enrolment into the study was done.

3.5 Exclusion Criteria

1. Health professionals who were on internship and students on their clinical rotation were excluded from the study.
2. Workers who were not at post or were ill at the time of the interview.

3.6 Sample Size Determination

The sample size was calculated using the Taro Yamane formula because the sample populationwas already known.

Yamane Formula: n = N/

(1+N (e)2)Where:

n is the sample size

N is size of the population under study

e is the margin of error 5% in this case e=0.05

A total staff population from 7 selected departments (based on the exposure to blood and body fluids encountered by staff who work in these departments) was **2,983**. The minimum sample size required was **353** participants. Adjusting for 10% non-response, a total of **400** participants were interviewed. Recruited staff cadre reflected their proportion in the departments and comprised of 59 doctors, 305 nurses and 56 laboratory technicians. The sampling was proportional to the size

of the staff in Korle-Bu Teaching Hospital.

3.5 Sampling

Systematic sampling technique was used where in each department the total sample quota was divided by the number of staff per cadre to obtain the sample interval, R. Every Rth HCW was selected after the first had been chosen from the first R participants by ballot.

3.6 Pretesting

The questionnaire was pre-tested in a set of twenty (20) individuals from the target population before being used for the actual research in order to ensure its quality. The questionnaire was designed in accordance with the objectives for the study. The actual research did not include participants who were used to pre-test the questionnaire. Information on the subjects' sociodemographic characteristics were also collected. It was then easy for me to find out the HCWs in KBTH's fundamental understanding of the Hepatitis B Virus (HBV), their Hepatitis B vaccination status, other HBV prevention strategies, and factors influencing their completion rate for the Hepatitis B vaccine.

3.6 Data collection tool and techniques used in data collection

Self-administered questionnaires were used for this study because the population under study were all literate. The questionnaire consisted six (6) sections namely ABCDEF with the following information; socio-demographic data, occupational data, knowledge about hepatitis B infection, hepatitis B vaccination status, factors associated with the completion of hepatitis B vaccination and hepatitis B risk assessment respectively. Approximately 15 to 20 minutes was required to complete the questionnaires. It is worthy to note that research assistants (data collectors) who were national service personnel were trained for five (5) days to assist with data collection. Their training included areas such as inclusion and exclusion criteria, how to respond to questions posed by the participants during the data

collection process and how to follow-up and retrieve completed questionnaires from the participants who could not fill out their questionnaires immediately.

3.7 Ethical Considerations

The work was submitted and ethical approval was received from the institutional review board of the KBTH for the research. Informed consent was obtained from each of the participants after the objectives of the study was explained to them prior to commencement of data collection. **Explanation was given to respondents that they were free to withdraw from the study anytime they wished hence participation was not under coercion. Apart from the length of data collection which served as a source of discomfort to respondents due to their busy work schedules, no other risks were associated with this study. The discomfort was however averted by minimizing interruptions to shorten the time of data collection. There were no direct benefits associated with this study, however respondents were assured that the findings of the study would be shared with the hospital management to provide evidence to facilitate the implementation of policies to protect them against hepatitis B infection. To ensure confidentiality, the identities of the respondents were anonymized and they were reassured that information obtained would not be shared with a third party except my supervisor who may access my records. To ensure privacy, the completed questionnaires were collected daily and kept safely under lock and key with only the principal investigator having access.** The conduct of the entire study was in strict alignment with the national COVID -19 protocols including social distancing handwashing and wearing of face/nose masks during interactions withparticipants.

3.8 Data Processing and Analysis

A Microsoft Excel spreadsheet was used to verify, format, and record the data, and STATA version 17 was used to clear and analyze it. (STATA Corp, Texas USA). Knowledge items were given scores and participants' scores were summed up. The highest score expected was 12 and minimum was 0. Any score ≥8 was considered as adequate knowledge score and any score <8 was inadequate. This cut-off was based on the consideration that, a score of 60% of the total represents adequate knowledge. **This instrument was self-generated by the candidate to measure the knowledge of the respondents about hepatitis B. Twelve (12) questions were asked on knowledge of hepatitis B and participates who answered eight or more questions correctly were considered as having adequate knowledge about hepatitis B and those who answered less than eight questions correctly were considered as having inadequate knowledge about hepatitis B.** Data visualization was presented using tables and diagrams whilst descriptive statistics using rates and percentages were computed using the appropriate measures of central tendency and dispersion was the first step in the data analysis process. Crude analysis of associations using chi- squared, or Fisher's exact tests was done. This was followed by bivariate and multivariable (analysis) logistic regression modelling because the outcome variable was binary (outcome was dichotomized). P-values of 0.05 were considered statistically significant relationship between two factors. The model for multivariable factors included variables from the univariate study with p- values < 0.2.

CHAPTER FOUR

RESULTS

4.1 Demographic Statistics of Respondents

The mean age for the study was found to be 31 years. There were more females, 290(72.5%) enrolled than males in the study. Respondents with various levels of education were recruited into the study with the majority (48.0%) being first degree holders. Single HCWs were more than the married and divorced in this study.

Table 4.1: Demographic statistics of respondents

Variable		Frequency (n=400)	Percent
Age	18-24 years	41	10.3
	25-29 years	154	38.5
	30-39 years	153	38.3
	40-49 years	41	10.3
	50- 59 years	11	2.6
Sex	Female	290	72.5
	Male	110	27.5
Education	Certificate	43	10.8
	Degree	192	48.0
	Diploma	135	33.8
	Post graduate	30	7.5
Marital Status	Single	210	52.5
	Married	174	43.5
	Divorced/separated	16	4

4.2 Occupational Statistics

The study consisted largely of nurses compared to other categories of HCWs. Majority of the respondents interviewed had worked for 1-5years in the hospital.

Table 4.2: Occupational status of respondents

Variables		Frequency	Percent
Category of Staff	Doctor	51	12.7
	Nurse	220	55.0
	Midwife	48	12
	Laboratory technician	51	12.7
	Others	30	7.5
No. of Years Practice	1-5 years	261	65.3
	6-10 years	72	18
	11-15 years	32	8
	16-20 years	19	4.8
	20 years or above	16	4
No. of Years Working in KBTH	1-5 years	279	69.8
	6-10 years	60	15
	11-15 years	31	7.8
	16-20 years	17	4.3
	20 years or above	13	3.3

4.3 Knowledge about Hepatitis B Infection

The anticipated maximum score was 12 and the expected lowest score was 0. Any score above 8 was regarded as adequate knowledge and any score below 8 was inadequate. Of the 400 participants included in the study, only 176 (44%) had scored 8 or more and hence were classified as having adequate knowledge about hepatitis B. Almost all the participants, 379 (94.7%) had heard about HBV, however 180 (45.0%) had adequate knowledge about the route of transmission. Even though all the participants agreed that hepatitis B is preventable, 162(40.5%) had sufficient knowledge about the preventive measures. Surprisingly some of the participants, 131(36.5%) **did not know when they were supposed to have sought** Post Exposure

Prophylaxis (P.E.P.). Approximately 63.5% (254) participants knew about the complications that may occur following infection with the HBV. In the same vein, a good number of the participants also had adequate knowledge about the schedule and number of doses required for the hepatitis B vaccination. Interestingly, majority 384(96.0%) of the participants agreed that booster doses **were** required however only a handful 113(28.25%) and 56(14.0%) knew the number of booster doses required by HCWs and when they **were** expected to receive them respectively to enhance their immunity.

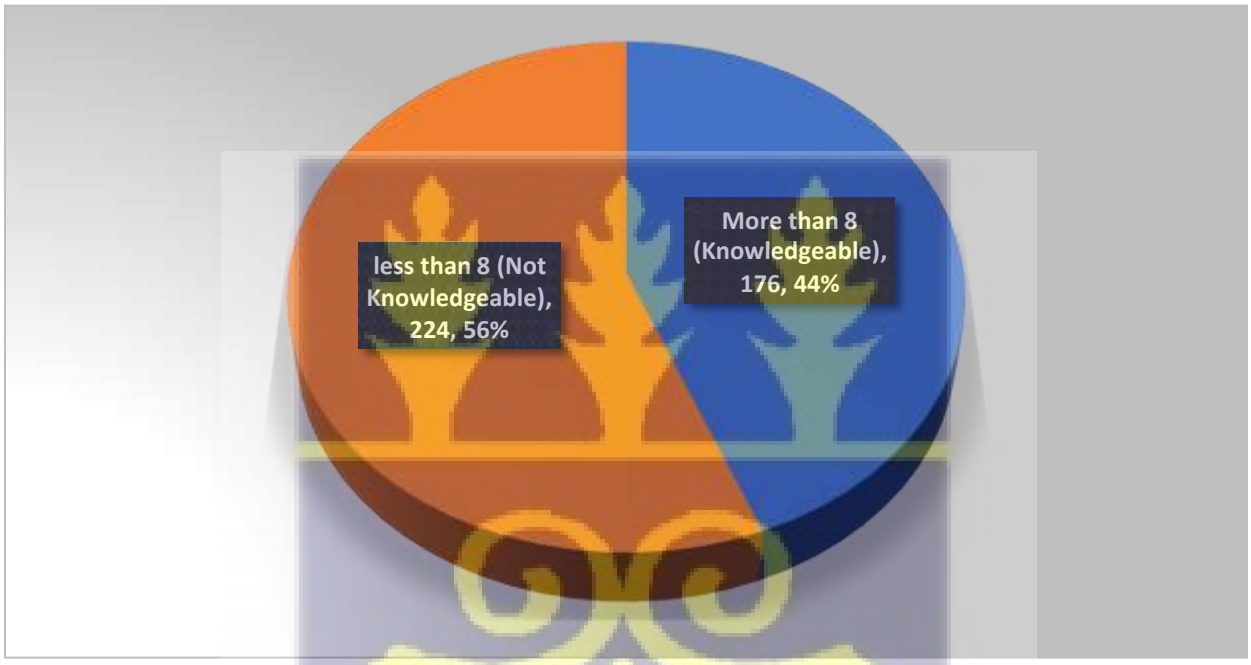

Figure 4.1: Knowledge status of respondents on Hep B infection

4.4 Hepatitis B Vaccination Status

Three hundred and seventy-three, (373, 93.3%) respondents reported that they **had** been vaccinated against hepatitis B with 27 (6.8%) unvaccinated. HCWs who had received 3 doses of the vaccine were 323 (86.6%) however these may have included those that defaulted on the schedule and so might effectively not have taken three vaccination doses. On the other hand

others may have actually completed their vaccinations on the 3rd dose as expected. Unfortunately, a few of the respondents 10 (2.7%) had received only one dose of the vaccine. Among those who were fully vaccinated, 68 (17%) **had** received their booster doses. Majority of the participants, 257(68.9%)had their Hepatitis B vaccination at KBTH whereas 116 (31.1%) had their vaccinations at other places than KBTH.

Table 4.3: Hepatitis B vaccination status

Variable		Frequency	Percent
Are you vaccinated?	**Yes**	373	93.3
	No	27	6.8
How Many Doses Received	**1 dose**	10	2.7
	2 doses	31	8.3
	3 doses	323	86.6
	4 doses	9	2.4
Received Booster	**Yes**	68	18.2
	No	305	81.8
Where Hepatitis B Vaccine Was Taken	**At KBTH, during mass vaccination for staff**	91	24.4
	At KBTH, during pre-employment screening and vaccination	84	22.5
	At KBTH, just walked in	82	21.9
	At my local church	51	13.7
	Others	65	17.4

4.5 Completion of Hepatitis B vaccination

Majority of HCWs, 285(78.1%) were reported to have completed their vaccinations. Time constraint, 18 (22.5%), financial constraint, 17 (21.2%) and forgetfulness of appointment dates, 43(53.7%) were some of the reasons given for non-completion of the vaccination. Most (282, 80.1%) of the HCWs vaccinated, did not experience any adverse reactions to the vaccines. Majority of the participants, 200 (56.4%) were of the view that follow-up calls or text messages should be sent as reminders of appointment dates to improve completion of the vaccination whilst other respondents, 140 (39, 4%) advocated for free hepatitis B vaccination for staff.

Table 4.4: Completion of Hepatitis B

Variable		Frequency	Percent
Did You Complete	**Yes**	285	78.1
	No	80	21.9
If No, Reason	**Time Constraint**	18	22.5
	Financial constraint	17	21.2
	forgot my appointment date	43	53.7
	Afraid of injection	2	2.5
Experience Any Adverse Reaction	**Yes**	70	19.9
	No	282	80.1
Improvement of Hepatitis B Service	**Periodic vaccination for staff at their departments**	15	4.2
	Vaccination for staff should be free	140	39.4
	There should be follow-up calls or text messages as reminders	200	56.4

4.6 Hepatitis B Risk Assessment

A total of 115 (31.9%) HCWs at KBTH reported to have suffered needle stick injuries whilst on duty, out of which 16 (14.0%) had been injured more than 5 times. About half of these HCWs who suffered the needlestick injuries (52, 45.6%) had at least once in the course of their work. Majority 82 (71.3%) recalled that they were exposed to the needlestick injuries after receiving their HBV vaccination. After such incidence 33, (28.7%) initiated an intervention to reduce the risk of the transmission of diseases by squeezing the site and washing with water. Twenty-seven (23.5%) reported the injuries to the appropriate authorities and were given Post Exposure Prophylaxis (PEP) whilst the other 17(14.78%) of the respondents took no action. Out of the number who encountered needlestick injuries, 65 (56.5%) received counselling to help minimize the psychological trauma. A large number of the HCWs, 87 (75.6%) claimed they were adequately protected against the hepatitis B infection.

Table 4.5: Hepatitis B Risk Assessment

Variable		Frequency	Percent
Needlestick Injury	Yes	115	31.9
	No	246	68.1
If Yes, How Many	Once	52	45.6
	Twice	34	29.8
	Three times	9	7.9
	Four times	4	3.5
	More than 5 times	16	14.0
Occurrence Of Needlestick	Before vaccination	15	13.0
	after vaccination	82	71.3
	Halfway through the vaccination	2	1.7
	Cannot remember	16	13.9
Action Taken	No action	17	14.8
	Reported to my in-charge	33	28.7
	Squeezed the site and washed	33	28.7
	Did not know	5	4.3
	Reported and was given PEP	27	23.5
Received Counselling	Yes	65	56.5
	No	50	43.5
Adequately Protected	Yes	87	75.6
	No	28	24.3

4.7 Factors affecting completion of hepatitis B vaccination

Age, educational level and category of HCW were found to be significantly associated with the completion of hepatitis B vaccination among HCWs at KBTH.

Respondents in the age bracket of 25-29years had 3.5 times increased odds of completing their hepatitis B vaccination as compared to other HCWs in other age groups with a p-value of 0.005 **[AOR 3.50(CI : 1.45 – 8.42)].** Males were 11% less likely to complete their vaccination compared to females but the confidence **interval was wide [AOR 0.89(CI: 0.48-46.82)].**

Diploma and degree holders were 2.6 times more likely to complete their vaccination compared to certificate holders [AOR 2.64(CI: 1.04 – 6.68)] and [AOR 2.29(CI: 0.96- 5.46)] respectively. It is worthy to note that Diploma holders had advanced knowledge and qualification compared to ordinary certificate holders. Postgraduate HCWs had higher odds of completing their vaccination than certificate holders but again the ratios were high with wide confidence interval. [AOR 14.78(CI: 2.73- 80.18)]. There was a statistically significant association between being a diploma or postgraduate degree holder and completion of hepatitis B vaccination: p-values were 0.041 and 0.002 respectively. Participants who were married/separated were less likely to complete their vaccination compared to single respondents [AOR 0.88(CI: 0.47-1.64) and [AOR 0.31(CI: 0.09-1.07)] respectively but there was no statistically significant difference between the two (2) groups. There was a statistically significant association between midwifery practice and completion of hepatitis B vaccination (p-value: 0.041). Doctors, midwives and laboratory technicians were less likely to complete their vaccination compared to nurses [AOR: 0.46(CI: 0.21 - 1.16)], [AOR 0.45(CI: 0.2 - 0.970] and [AOR 0.60(CI: 0.26 - 1.38) not statistically significant. There was no significant association between the number of years one had practiced his/her profession and completion of hepatitis B vaccination.

Respondents who had practiced their professions for more than five years were less likely to complete their vaccination than those who had practiced their professions for the first 5 years as follows; 6 - 10 years [AOR 0.43(CI: 0.21 – 0.87)], 11 – 15 years[AOR 0.38(CI: 0.13 – 1.13)], 16 – 20 years [AOR 0.34(CI: 0.06 – 1.87)] and 20 or more years [AOR 0.51(CI: 0.09 – 3.06)].

Table 4.6: Factors affecting completion of hepatitis B vaccination

Variable		COR (95% C.I)	P-value	AOR (95% C.I)	P-value
Age	18-24 years	1		1	
	25-29 years	3.20 (1.43-7.13)	0.004	3.50 (1.45-8.42)	*0.005
	30-39 years	1.63 (0.76-3.47)	0.207	2.25 (0.89-5.71)	0.087
	40-49 years	1.49 (0.57-3.93)	0.362	4.51 (0.87-23.29)	0.072
	50 or more years	1.52 (0.26-8.93)	0.642	4.76 (0.48-46.82)	0.181
Sex	Female	1		1	
	Male	1.09 (0.64-1.85)	0.760	0.89 (0.47-1.72)	0.743
Education	Certificate	1		1	
	Diploma	3.31 (1.48-7.39)	0.003	2.64 (1.04-6.68)	*0.041
	Degree	2.00 (0.95-4.23)	0.067	2.29 (0.96-5.46)	0.062
	Post graduate	9.75 (1.99-47.64)	0.005	14.78 (2.73-80.18)	*0.002
Marital	Single	1		1	
	Married	0.86 (0.52-1.40)	0.539	0.88 (0.47-1.64)	0.678
	Divorced/Separated	0.24 (0.08-0.71)	0.009	0.31 (0.09-1.07)	0.065
Category	Nurse	1		1	
	Doctor	0.63 (0.31-1.31)	0.219	0.46 (0.21 -1.16)	0.106
	Midwife	0.54 (0.26-1.10)	0.089	0.45 (0.21-0.97)	*0.041
	Laboratory Technician	0.48 (0.24-0.97)	0.040	0.60 (0.26-1.38)	0.229
	Other	1.05 (0.37-2.95)	0.926	1.04 (0.30-3.55)	0.954
No of year of Practice	1-5 years	1		1	
	6-10 years	0.39 (0.21-0.74)	0.004	0.43 (0.21-0.87)	*0.019
	11-15 years	0.42 (0.18-0.96)	0.040	0.38 (0.13-1.13)	0.083
	16-20 years	0.59 (0.19-1.74)	0.335	0.34 (0.06-1.87)	0.216
	20 or more years	0.73 (0.19-2.80)	0.649	0.51 (0.09-3.06)	0.463

*Statistically significant ($p<0.05$)

CHAPTER FIVE

DISCUSSION

5.1 Knowledge about HBV and hepatitis B vaccination

The results of this research, which shows that HCWs have a limited knowledge of HBV, is consistent with that of a study done in Freetown, Sierra Leone, which found that 77.3% of HCWs were unaware of the clinical outcomes of HBV infection and that 63 (29.9%) and 93 (44.1%) had inadequate knowledge of the transmission mechanisms and HBV prevention strategies, respectively (Qin et al., 2018). This study's result indicating majority of HCWs having greater awareness of HBV corresponds with another study carried out by (Akazong et al., 2020) in Cameroon which indicated that majority of the HCWs (84.9%) had heard of HBV.

The findings of this study contrasts with a study conducted in Afghanistan by Roien and colleagues in-which the knowledge of HCWs was found to be 86.5% compared to that of this study (44%) and the group with the highest educational level demonstrating better knowledge than the group with lower educational level (Roien et al., 2021). Another contradicting study to this one was conducted in Lagos state in Nigeria, by (Omoyeni et al., 2013) which found that majority (70.2%) of the participants' demonstrated good knowledge of hepatitis B infection and vaccination as against this study's overall knowledge of 44%. Furthermore, knowledge about the mode of transmission and effective measures of prevention had low scores (45.0%and 40.0%) in this study compared to their 90.4% and 67.9% respectively. The study by (Okwara et al., 2012) further contradicts this study with regards to the knowledge of participants being higher in their study 159(94%) compared to this study (44.0%). **The low level of knowledge about hepatitis B demonstrated by health professionals in this study cannot be blamed on the training received by these HCWs instead on the fact that health professionals paid very little**

attention to this all important health issue and did very little to acquire more information on their own even if there were gaps in their training considering the fact that information now a days is very easy to come by.

5.2 Hepatitis B Vaccination Status

With regard to the hepatitis B vaccination status of HCWs, a number of studies have found results that differ from those of this study. One such study was conducted by (Ansa et al., 2019) which showed that the uptake of hepatitis B vaccination among healthcare workers at University of Ghana Hospital, Legon was 53% compared to the 78.1 recorded in this study. A similar study was conducted by (Ngum et al., 2021) which revealed that only 39 (13.9%) participants out of 280 were fully vaccinated as compared to 241 (86%) who were partially vaccinated or unvaccinated which was also contrary to this study as stated above.

The results of this research also conflicts with that of a study done at Linkoping University Hospital in Sweden, where 79% of HCWs (293/369) reported receiving at least one dose of the vaccination, but only 40% (147/369) reported receiving all three doses, and 21% (76/369) reported receiving no vaccination at all. The researcher identified refusal of the employer to implement policies concerning protection of HCWs including prevention of diseases as the major obstacle to better compliance rather than lack of acceptance among the HCWs. This is because the HCWs indicated their willingness to be vaccinated if offered the opportunity (Dannetun et al., 2006).

Harun et al., (2023) reported in their study that majority (89.2%) of the participants who were unvaccinated wished they received free vaccinations in the future. This is consistent with the findings of this study in-which 140 (39.4%) of the participants also advocated for free hepatitis B vaccination for HCWs. **This consistency between our study and earlier studies can be understood because health professionals expect their employers to cater for their safety needs while offering services. The question of ''who cares for healthcare worker'' always arises in this scenario and deserves to be answered. Considering the financial situations of HCWs and the economic conditions in most countries, it would be very helpful for employers to fulfil their responsibility of providing free hepatitis B vaccination for HCWs to relief them from the burden of payment and ultimately safeguard their health. If this does not happen however, the responsibility then lies on these HCWs to rise up and take their destinies into their own hands by getting vaccinated out of their pockets.**

Another contradicting finding to this study was from a systematic review and meta-analysis carried out by (Auta et al., 2018) which found the estimated full hepatitis B vaccination coverage to be 24.7% which was extremely low among HCWs compared to the findings of this study which was 78.1%. The common reasons identified for non-completion of vaccination of HCWs was their reported "busy work schedules," (37.5%) and cost of vaccination (18.4%) which were similarly reported as time constraints (22.5%) and financial constraints (21.2%) in this study. **It is quite sad to come to the realization that HCWs found excuses to defend their inability to complete their hepatitis B vaccination irrespective of its importance in protecting their health in the face of the risk they are faced with daily as they discharged their duties.** A good number of the HCWs at KBTH who had been fully vaccinated disclosed that they had their vaccinations done at the hospital during a mass hepatitis B vaccination exercise organized for all

the staff of the hospital between 2013 and 2014 as well as pre-employment medical screening and vaccination organized for new staff in 2018 and 2019.

5.3 Completion of Hepatitis B Vaccination among HCWs

This study's high (78.1%) completion rate of hepatitis B vaccination contradicts the one conducted by (Ngum et al., 2021) at Bamenda Health District which reported a very low completion of hepatitis B vaccination 39 (13.9%) out of the 280 respondents interviewed with majority of the participants 241(86%) partially vaccinated or unvaccinated. Similarly, (Ogoina et al., 2014) also reported a low hepatitis B vaccination completion rate 105 (36.2%) out of 290 HCWs who participated in the study with 185 (64.5%) having received at least one dose of the vaccine and 102 (35.5%) having received no hepatitis B vaccination which was contrary to our study.

In the same vein, a contradictory report was obtained by (Aaron et al., 2017) in their study in-which, 198 (56.9%) had been given at least one dose of hepatitis B vaccination out of a total of 348 HCWs while only 117 (33.6%) were fully vaccinated.

At the University of Ghana Hospital, researchers examined whether medical staff at the facility were willing to accept the Hepatitis B vaccine. (Ansa et al., 2019) found a low immunization rate (53%), which is below our study's results, and stated that the low coverage could be a result of lax measures ensuring that freshly hired HCWs are completely immunized before starting work at the facility. They also provided further insight on the factors that contribute to the poor uptake of the hepatitis B vaccine, pointing out that in Ghana, employment at public health institutions like the UGHL is not conditioned upon undergoing hepatitis B screening or receiving vaccination against the illness. As a result, HCWs are free to take the responsibility of getting vaccinated when they believe they are at risk of contracting the disease and are prepared to pay

the associated costs. **This lassitude that exists in government health institutions towards hepatitis B screening and vaccination among HCWs is detrimental to the health of healthcare professionals and should be curbed by putting into place stringent measures that ensures that HCWs undergo hepatitis B screening and vaccination before they are offered their appointment letters in order to safeguard their health whilst discharging their duties**. Another investigation, conducted by (Okwara et al., 2012) found that 86 (54.8%) of HCWs had received the hepatitis B vaccine, of which only 48 (29.78%) had completed three (3) doses; this was more prevalent among those with tertiary education (OR 2.6; 95%CI 1.2-5.8). Their findings conflicted with those of this study.

Son et al., (2021) also came up with a contradicting finding in their study which discovered that only 40% of newly employed doctors and nurses had completed their vaccination against hepatitis B infection which was lower than the 78.1% obtained in this study. Healthcare personnel asked to be frequently informed of immunization requirements and outcomes of monitoring vaccination rates. The findings of this study is consistent with the one carried out by (Rauf Alhassan, 2021) among nurses at Tamale Central Hospital which revealed the completion rate (at least three doses) of hepatitis B vaccination among the respondents to be 77.3% which is very close to the 78.1% obtained in this study. This supports the assertion that the hepatitis B immunization rate is increasing among nurses as revealed in this study. **This success among nurses is attributable to the fact that the nursing fraternity is dominated by females and females by nature are compliant compared to their male counterparts hence they are able to follow through and complete their vaccination**. It is also interesting to note that vaccination completeness was proportionally higher among those married as compared to those who were

single which contradicts the findings of this study in-which single respondents had a higher hepatitis B vaccination completion rate as against the married and separated or widowed respondents. **This trend could probably be due to single people being more careful about maintaining their hepatitis B negative status in order to avoid losing prospective suitors. The married, divorced/separated or widowed may not find it that necessary to get vaccinated against hepatitis B as they perceive their stakes are low regarding this vaccination. On a lighter note, wider access to information on the internet and social media platforms could contribute to single people having more hepatitis B vaccination rates unlike their married counterparts because they may likely have more time to spend on these platforms. On the whole, it's worth mentioning that the success of completion of the hepatitis B vaccination among HCWs in Korle-Bu Teaching Hospital is attributable to the efforts made by the Public Health Unit of the hospital by organizing free health screening and vaccination for all staff in 2013 as well as pre-employment medical screening and vaccination for newly employed staff in 2017 and 2018. Factors that contributed to the success of these vaccination programs by the Public Health Unit included a good follow-up system through phone calls and text messages that reminded HCWs of their due vaccination dates**.

5.4 Factors Associated with Hepatitis B Vaccination Completion Rate

The contributing factors to the prevention of hepatitis B vaccination were identified by (Duodu et al., 2022) to include professional qualification which is consistent with the findings of this study in-which post-graduate qualification being the highest among the levels of education was found to be statistically significantly associated (p-value: 0.002) with the completion of hepatitis B vaccination. This is probably so because more years of training in healthcare institutions

exposes one to more knowledge about diseases and their prevention which could be the reason why this study identified respondents with higher levels of education to have completed their vaccination. Similarly, the age bracket of 25 -29 years was identified as the modal age group with the highest vaccination completion rate. **Explanation to the 25-29 years age phenomenon is that people in this age bracket are usually fresh from school and just beginning their careers hence they are enthusiastic about doing things that protects them on the job**. Interestingly (Hussein et al., 2022) also found in their study carried out in Puntland Somalia that hepatitis B vaccine uptake varies among occupations and age groups. This is similar to the findings of this study in-which nurses were reported to have the highest completion rate of hepatitis B vaccination hence used as the reference point of comparison for other categories of HCWs. This occurrence may be due to the nursing population consisting largely of females who naturally are health conscious and compliant compared to their male counterparts. Further explanation may be given that nurses are usually closer to the patients and therefore perceive themselves to be at higher risk of contracting the hepatitis B infection compared to the other categories of HCWs hence take steps towards prevention. Other similarities between these two studies are the sex of participants not being significantly associated with vaccination completion rate implying that both males and females had the same vaccination completion rate

5.5 Limitation of the Study

Korle-Bu Teaching Hospital being very large with several departments and a vast range of healthcare worker categories, recruiting participants from all the departments would be very tedious and time consuming as well as have financial implications hence only 7 out of 13 departments were selected to partake in the study. Similarly, the study focused only on doctors, nurses, midwives and laboratory technicians due tothe high risk of infection associated with their

work. This cross-section of the departments and categories of HCWs are however expected to be a true representation of the HCWs at KBTH. **Consequently, findings and recommendations of this study can be generalized to other government health institutions because they all operate under similar conditions and protocols.**

5.6 Conclusion

This study found that the knowledge about Hepatitis B infection is low (44%) and cannot equip HCWs enough to prevent this serious illness and its complications. Even though most of the HCWs have had their hepatitis B vaccination, some of them did not complete the 3 doses (21.9%) hence putting them at risk of acquiring the infection in the course of discharging their duties. Some of the reasons given for non-completion of the vaccination were time constraint, financial constraint, forgetfulness of appointment dates and fear of injection (anticipated pain). Sadly, out of the large number (78.1%) of participants who have been vaccinated only a few of them (17.0%) have had their booster doses. Age, educational level and category of HCWs were identified as factors which were strongly associated with the completion rate of hepatitis B vaccination.

5.5 Recommendation

1. There is a need to intensify health education about hepatitis B infection among HCWs at Korle-Bu Teaching Hospital.
2. The 78.1% vaccination coverage could be increased if pre-employment medical screeningand vaccination against hepatitis B is maintained which was previously the case.
3. There should be frequent departmental engagements to sensitize HCWs about hepatitis B vaccination.
4. Healthcare workers should be periodically re-oriented on post-exposure management protocols.
5. Occasionally surveys should be carried out in the various departments to assess the hepatitis B vaccination uptake among newly employed healthcare professionals in the hospital.

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APPENDIX I: PARTICIPANT INFORMATION SHEET

Title: Factors affecting the completion rate of hepatitis B vaccination among Healthcare workers at Korle-Bu Teaching Hospital

Principal Investigator: Patience Quartey

Address: School of Public Health, University of Ghana. Email:

pquartey004@st.ug.edu.gh/patquartey2000@gmail.com Tel: 0244102557

General Information about Research

In Korle-Bu Teaching Hospital, arrangements to ensure that newly employed staff who test negative for hepatitis B are vaccinated before assumption of duty are non-existent.

Records show that most HCWs in KBTH are not fully vaccinated but are working at high-risk settings of the hospital where they are likely to accidentally come into contact with infected blood and body secretions. These exposures endangers the lives of most HCWs in KBTH. Unfortunately, where the opportunity exists for taking the vaccine, most healthcare workers fail to complete the vaccination schedule.

This study therefore seeks to explore the knowledge of hepatitis B infection and to measure the completion rate of hepatitis B vaccination among healthcare workers at the Korle-Bu Teaching Hospital. Findings from this study will help policy makers and other stakeholders to implement policies (such as vaccination) that promotes the safety and protection of HCWs.

Nature of Research

This is an observational cross-sectional survey that will involve at least 400 staff at the Korle-Bu Teaching Hospital. Systematic sampling technique would be used to recruit health staff in the hospital who fall within the inclusion criteria. I invite you to take part in this research project. If you accept, you will be required to sign or give oral consent to this study. Afterward, you will be

offered a questionnaire by the Research Assistant to fill out. The questionnaire contains questions on the knowledge of health staff on hepatitis B infection which includes the mode of transmission, preventive measures, possible complications, vaccination schedules. The hepatitis B vaccination statuses of staff will be assessed and barriers to compliance to schedules determined among others. The study is expected to last for a maximum of 20 minutes.

Possible Risks and Discomforts

There are minimal discomforts potentially associated with partaking in this study. The length of time for data collection may serve as a source of discomfort to respondents. Care would be taken to minimize interruptions during the data collection period to shorten interview times.

Possible Benefits

You may not get any direct benefit, but the findings of this study will be made available to the management of the hospital. This would be instrumental in providing evidence to facilitate the implementation of policies that protects health staff against infectious diseases they may acquire in the course of discharging their duties such as hepatitis B which can easily be prevented through vaccination.

Confidentiality

I will protect information about you to the best of my ability. Your name would not be provided on the questionnaires. Information obtained will not be shared with a third party other than my supervisor who may access my records.

Compensation

There are no compensation packages whether in cash or kind available for participation.

Voluntary Participation and Right to Leave the Research

This study is strictly voluntary. Should you, at any point during the study, decide that you do not wish to participate any further, you are free to terminate your participation immediately.

Termination of Participation by the Researcher

No circumstance may cause your termination from this study.

Outcome and Feedback

Data obtained at the end of the study would be presented to the management of the Korle-Bu Teaching Hospital to keep it updated on the hepatitis B vaccination statuses of health staff and enable them to devise strategies to improve the uptake if the need be.

Feedback to participant

Feedback of findings would be communicated to participants at the end of the study on request.

Funding Information

The study would be self-funded by the Principal Investigator

Sharing of Participants' Information/Data

Participants' identification would be anonymized during the data collection period. The final data obtained would be shared with the hospital, the district directorate, and the savannah regional directorate, as well as communicated to participants on request.

Data Access and Storage

The completed questionnaires for the quantitative study will be collected each day and stored safely under lock and key with only the principal investigator having access.

The coded questionnaires will be entered into Microsoft Excel 2016 with a password by the principal investigator.

Provision of Information and Consent for Participants

A copy of the Information sheet and Consent form will be given to you after it has been signed orthumb-printed to keep

Contacts for Additional Information

You may contact me, Principal Investigator (Patience Quartey, 0244102557), or my supervisor (Dr. Alexander Manu 0244619629) if you need further explanation of pertinent questions about this research.

Your rights as a Participant

This research has been reviewed and approved by the Ethical Review Board of the Korle-Bu Teaching Hospital (KBTH–ERB)If you have any questions about your rights as a research participant you can contact the KBTH-ERB Administrator, Mr. Nortey, between the hours of 8 am-5 pm through, 0245194761, email addresses:vonnortey@gmail.com

APPENDIX II: CONSENT FORM

STUDY TITLE: **Factors affecting completion of hepatitis B vaccination among Healthcare workers at Korle-Bu Teaching Hospital.**

PARTICIPANTS' STATEMENT

I acknowledge that I have read or have had the purpose and contents of the Participants' Information Sheet read and all questions satisfactorily explained to me in a language I understand (English). I fully understand the contents and any potential implications as well as my right to change my mind (i.e. withdraw from the research) even after I have signed this form.

I voluntarily agree to be part of this research. Name of Participant……

Participants' Signature ……...

Date:…….

INVESTIGATOR STATEMENT AND SIGNATURE

I certify that the participant has been given ample time to read and learn about the study. Allquestions and clarifications raised by the participant have been addressed.

Researcher's name…….

Signature …….

Date…….

Should you wish to contact me at any stage regarding consent you can contact me on Cell: +233 2441102557 or email: pquartey004@st.ug.edu.gh

UNIVERSITY OF GHANA

SCHOOL OF PUBLIC HEALTH

APPENDIX III: QUESTIONNAIRE

FACTORS AFFECTING COMPLETION OF HEPATITIS B VACCINATION AMONG HEALTHCARE WORKERS AT KORLE-BU TEACHING HOSPITAL

SECTION A (SOCIO-DEMOGRAPHIC DATA)

SECTION A (Socio-Demographic data)

1. How old are you ?

☐ 18- 24 years

☐ 25-29 years

☐ 30-39 years

☐ 40-49 years

☐ 550 and above

2. What is your gender?

☐ Male ☐ Female

3. What is your highest level of education?

☐ Certificate

☐ Diploma

☐ Degree

☐ Postgraduate

4. What is your marital status?

☐ Single

☐ Married

☐ Separated

☐ Divorce

SECTION B (OCCUPATIONAL DATA)

5. Which category of healthcare worker are you?

☐ Doctor

☐ Nurse

☐ Midwife

☐ Laboratory technician

☐ Others, Specify……..

6. In which department of the hospital do you work ?

Please specify……..

7. How many years have you been practicing your career?

☐ 1-5 years
☐ 6- 10years
☐ 11- 15 years
☐ 16- 20years
☐ 20 years and more

8. How many years have you been working in this hospital

☐ 1-5 years
☐ 6 -10 years
☐ 11 -15 years
☐ 16 – 20 years
☐ 20 years and more

SECTION C (KNOWLEDGE ABOUT HEPATITIS B INFECTION)

9. Do know about Hepatitis B infection?

☐ YES ☐ NO

10. How is Hepatitis B infection transmitted?

Tick all that apply

☐ Through blood and body fluids

☐ Sharing of sharp objects with others

☐ Recapping of needles

☐ Consuming contaminated food and water

☐ Shaking hands or touching someone who has Hepatitis B infection

☐ Through contaminated blood transfusion

11. Is Hepatitis B infection preventable?

☐ YES ☐ NO

12. If YES, how can Hepatitis B infection be prevented?

Tick all that apply

☐ Through wearing of gloves before handling blood and body fluids

☐ Avoidance of recapping of needles

☐ Frequent handwashing when caring for patients

☐ Avoidance of close contact with Hepatitis B positive patients

☐ Through vaccination

13. Do you think Hepatitis B infection is curable?

☐ YES ☐ NO

14. When should someone seek post-exposure prophylaxis?

Tick all that apply

☐ After a needlestick injury

☐ After caring for a known Hepatitis B positive patient

☐ After a splash of blood or body fluids into the eyes

☐ After eating together with a known Hepatitis B positive patient

15. What are the complications of Hepatitis B infection?

Tick all that apply

☐ Liver cirrhosis
☐ Liver cancer
☐ Liver failure
☐ Kidney failure
☐ Stomach cancer

16. How many doses of Hepatitis B vaccination is required for effective prevention?

☐ 1 dose

☐ 2 doses

☐ 3 doses

☐ 4 doses

17. What is the schedule for Hepatitis B vaccination?

☐ On contact, 1 month and 3 months
☐ On contact, 1 month and 4 months
☐ 0n contact, 1 month and 5 months
☐ On contact, 1 month and 6 months

18. Is there is a need for booster dose?

☐ YES ☐ NO

19. How many booster doses are required for healthcare workers

☐ 1 dose
☐ 2 doses
☐ 3 doses
☐ 4 doses

20. After how many years should the booster dose be taken from the primary doses?

☐ 1 to 3 years
☐ 4 to 5 years
☐ 6 years
☐ 7 to 10 years
☐ After 10 years

SECTION C (HEPATITIS B VACCINATION STATUS)

21. Have you ever had Hepatitis B vaccination before?

☐ YES ☐ NO

22. How many doses did you take?

☐ 1 dose
☐ 2 doses
☐ 3 doses
☐ 4 doses

23. Did you complete your Hepatitis B vaccination?

☐ YES ☐ NO

24. If No, what were the reasons for your non-completion?

☐ Time constraint
☐ Financial constraint
☐ I forgot the due date
☐ I was afraid of the injection

25. Where did you take your Hepatitis B vaccination?

- ☐ At KBTH during the mass screening and vaccination
- ☐ During my training at school
- ☐ At church
- ☐ During a community outreach
- ☐ Walked in voluntarily for the vaccination

26. Did you experience any adverse reaction after the vaccination?

☐ YES ☐ NO

27. Have you had a needlestick injury before?

☐ YES ☐ NO

28. If YES, how many times?

- ☐ Once
- ☐ Twice
- ☐ Three time
- ☐ Four times
- ☐ More than five times

29. Did the needlestick injury occur before or after your Hepatitis B vaccination?

- ☐ Before vaccination
- ☐ After vaccination
- ☐ Halfway through the vaccination
- ☐ I cannot remember

30. What action did you take?

- ☐ 1 took no action
- ☐ I reported to my in-charge
- ☐ I squeezed the site and washed with adequate amount of water
- ☐ I did not know where to receive post-exposure prophylaxis
- ☐ I reported and was given post- exposure prophylaxis

31. Did you receive any counseling and testing after needlestick injury?

☐ YES ☐ NO

32. Do you think you are adequately protected against Hepatitis B infection?

☐ YES ☐ NO

APPENDIX IV: APPROVAL LETTER FROM KORLE-BU

In case of reply the number
And the date of this
Letter should be quoted
My Ref. No. KBTH/IRB/C-3/23
Your Ref. No.

KORLE BU TEACHING HOSPITAL
P. O. BOX KB 77,
KORLE BU, ACCRA.
Tel: +233 302 667759/673034-6
Fax: +233 302 667759
Email: info@kbth.gov.gh
pro@kbth.gov.gh
Website: www.kbth.gov.gh

2nd February, 2023

PATIENCE QUARTEY
SCHOOL OF PUBLIC HEALTH
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA

FACTORS AFFECTING COMPLETION OF HEPATITIS B VACCINATION AMONG HEALTHCARE WORKERS AT KORLE BU TEACHING HOSPITAL

KBTH-IRB 000217/2022

Investigator: PATIENCE QUARTEY

The Korle Bu Teaching Hospital Institutional Review Board (KBTH IRB) reviewed and granted approval to the study entitled: "Factors Affecting Completion of Hepatitis B Vaccination among HealthCare Workers at Korle Bu Teaching Hospital"

Please note that the Board requires you to submit a final review report on completion of this study to the KBTH-IRB.

Kindly, note that, any modification/amendment to the approved study protocol without approval from KBTH-IRB renders this certificate invalid.

Please report all serious adverse events related to this study to KBTH-IRB within seven days verbally and fourteen days in writing.

This IRB approval is valid till 31st January, 2024. You are to submit annual report for continuing review.

Sincere regards,

DR. DANIEL ANKRAH
VICE CHAIR (KBTH-IRB)
FOR: CHAIR (KBTH-IRB)

Cc: The Chief Executive Officer, KBTH
The Director of Medical Affairs, KBTH