

UNIVERSITY OF CAPE COAST

KNOWLEDGE, ATTITUDE AND PRACTICES OF TEACHER TRAINEES  
ON THE PREVENTION OF HEPATITIS B VIRUS INFECTION IN THE  
KUMASI METROPOLIS

RICHARD ARTHUR

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KUMASI METROPOLIS

BY

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Education

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## DECLARATION

### Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature: ..... Date: .....

Name: Richard Arthur

### Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

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Name: Dr. Charles Domfeh

## ABSTRACT

The purpose of this study was to investigate the knowledge, attitude and practices of teacher trainees in the Kumasi Metropolis on Hepatitis B and its prevention and also ascertained the relationship between teacher trainees' level of knowledge and their practices on the prevention of hepatitis B. The study employed a descriptive cross-sectional survey design. Multistage sampling procedure was used to sample 300 teacher trainees in three Colleges of Education in the Kumasi Metropolis. Researcher generated questionnaire was the main instrument for the study. Frequency and percentages and Chi Square test of independence were used to analyze the data. The results revealed high knowledge, with positive attitude, and good practices, among teacher trainees in Kumasi metropolis. There was correlation between teacher trainees' level of knowledge on hepatitis B and their practices. The study found that there is high knowledge, positive attitude and good practices among the teacher trainees in the Kumasi Metropolis and these are likely to influence positively the pupils they are going to teach, enable pupils dispense good attitude and will also help to reduce prevalence of Hepatitis B in the Kumasi Metropolis. It was recommended that there is the need to improve upon the knowledge level of the trainees who exhibited low knowledge about Hepatitis B. The study also recommended that screening in the Colleges of Education must be made compulsory with education attached, and free compulsory vaccination programme must be introduced among the teacher trainees to help reduce prevalence of the disease.

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I also highly commend the Principals, senior house masters and the students of the selected Schools who participated in the survey. My gratefulness also goes to my family, who sacrificed immensely to support and spurred me on. Finally, to the many who, either by default or design have contributed to this worthy course, I say thank you so much.

**DEDICATION**

To Georgina, Vanessa and Haizel

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## CHAPTER ONE

### INTRODUCTION

#### **Background to the Study**

The world has been plagued with a lot of diseases including Hepatitis B. Hepatitis B is the world's most common liver infection, which is caused by a DNA-virus, the hepatitis B virus (HBV) (World Health Organization (WHO, 2012). Hepatitis B, also called inflammation of the liver, is one of the types of viral hepatitis and can cause both acute and chronic diseases (WHO). The most common types of viral Hepatitis are A, B, C, D and E. The Hepatitis B virus is highly contagious, 50-100 times more infectious than HIV, and transmission between people are through infected blood, semen, vaginal fluids and mucous membranes. The most common ways of transmission are by unprotected sex, unsafe blood transfusions, and unsafe use of needles, from mother to child at birth, close household contact and between children in early childhood (Mastroianni et al., 2011).

Compared to other sexually transmitted diseases, HBV is unique because it can be prevented with a vaccine (WHO, 2012). The secret killer as it is often called, all HBV infections do not give symptoms, meaning that there is the risk that people are carriers without knowing it (Weinbaum et al., 2009; WHO). However, some people may experience some acute symptoms like jaundice, fatigue, loss of appetite, nausea and/or abdominal pain. With the help of blood tests, early detection of infected persons can break the ongoing transmission and lead to necessary treatment with antiviral medication

(Nguyen et al., 2008; Weinbaum et al., 2009). It is also important to enable the identification and vaccination of those who share household with the infected person and sexual partners that might have become infected. There are few measures that HBV positive individuals can do to avoid transmission. For instance, they should notify sexual partners, the people they share their household with to test for hepatitis B and inform them of the need for vaccination.

Globally, two billion people have been infected with HBV at some point in time in their life time and 360 to 400 million people, which represents more than 5% of the world's population, are chronic carriers with an estimated 600,000 deaths each year due to consequences of HBV. It is estimated to be the tenth cause of deaths worldwide (WHO, 2008). The incidence of acute hepatitis B varies greatly from country to country as a result of insufficient reliable data and comparisons between countries is often difficult due to different reporting systems with limited quality (Grob, 1995).

The WHO has therefore demarcated the world according to chronic hepatitis B prevalence into three major blocks which include high, intermediate and low prevalence (WHO, 2008). High prevalence areas have a prevalence of chronic hepatitis B infection that is equal to or greater than 8% made up of countries from North America, South America, Sub-Saharan Africa and most Asian countries. Intermediate prevalence areas have a prevalence rate which ranges between 2% and 7% and include countries from South America, North Africa, Western Europe, Eastern Europe and the Indian subcontinent. Low prevalence areas are estimated to have a prevalence of chronic infection less than (2%) which includes most of the North American

countries, Australia and most of Western Europe including the United Kingdom.

New WHO data reveal that an estimated 325 million people worldwide are living with chronic hepatitis B virus (HBV) infection despite the fact that since 1982 there is a vaccine against HBV that gives 90-100% protection against the infection (WHO, 2017). The WHO Global hepatitis report, 2017 indicates that the large majority of these people lack access to life-saving testing and treatment. As a result, millions of people are at risk of a slow progression to chronic liver disease, cancer, and death (WHO). The consequence of this is that approximately 600 000 HBV related deaths every year around the world, where the cause is primary liver cirrhosis or liver cancer (Dunford et al., 2012; WHO, 2012).

The virus is transmitted differently between geographic regions and countries depending on how endemic the HBV is there. It is more common that the virus is transmitted through horizontal routes such as injecting drug use, high-risk sexual behaviour and receiving blood products in regions where the endemicity is low. When in regions with high endemicity, for example in Vietnam, HBV is primarily spread by vertical transmission early in childhood or perinatally, from mother to child at birth (Dunford et al., 2012). Even though all humans can be infected with HBV, Asians have the highest proportion (two thirds) of HBV-infected persons (The Hepatitis B Foundation, 2013).

HBV is endemic in Vietnam as in many other countries in Southeast Asia (Dunford et al., 2012) and it is the leading cause of chronic liver disease (Nguyen et al., 2008). Approximately 90% of the infants, who are infected

during their first year, develop chronic liver infections later in life. About 25% of the adults who developed these infections die from infection related conditions, such as liver cirrhosis or liver cancer (CDC, 2013). According to Bui et al. (2002), in the article by Nguyen, Dore and McLaws (2008), 8-25% of the Vietnamese population are carriers of chronic hepatitis B. That is approximately 8.4 million Vietnamese individuals. It was estimated in the year of 2005 that this resulted in 23,300 HBV-related mortalities per year in Vietnam (Dunford et al., 2012).

In the U.S, approximately 1.4 million residents are chronically infected with HBV (Nguyen et al., 2010; Weinbaum et al., 2009). According to the fact that during the years 1974-2008, 17.6 million people born in countries of intermediate or high prevalence of chronic hepatitis B have immigrated to the United States, there is an increased burden of chronic hepatitis B in the country (Mitchell, Armstrong, Hu, Wasley & Painter, 2011). More than half of the estimated chronic hepatitis B cases were from the Western Pacific region, from countries such as the Philippines, China and Vietnam. These were the main countries of birth for imported cases of chronic hepatitis B. Africa was the second largest region for imported cases of chronic hepatitis B. According to systematic review (Rossi et al., 2012) migrants from East Asia, the Pacific and Sub-Saharan Africa represented a high sero prevalence of chronic hepatitis B, 10.3-11.3%, and migrants from Eastern Europe, Central Africa and South Asia were intermediate sero prevalence.

The sero prevalence of chronic hepatitis B was low among migrants from the Caribbean, Latin America, the Middle East and North Africa. Refugees and asylum seekers had higher sero prevalence of chronic hepatitis

B compared to migrants. Although, the high prevalence of infectious HBV has been well documented worldwide in well-equipped correctional facilities, such information on the exact prevalence of the deadly disease has been so sparse in Africa. This could be attributed to underreporting and ineffective data collection strategies in the continent. However, from the few data available, it is estimated that out of the 360 million chronic global carriers of HBV, about 65 million of these chronic carriers live in Africa (WHO, 2004). In addition, of the estimated 1.3 million deaths recorded annually due to HBV related causes, about 250,000 come from Africa (Kew, 1992).

In a hospital-based study conducted in two different hospitals in Jirapa and Tumu in the Upper West Region of Ghana by a Cuban Medical Brigade has shown that in 2009, 128 admitted patients were tested HBV positive and that majority of the cases were between the ages of 30-44 years (GHS, 2009). Another hospital-based study of pregnant women in Accra the capital of Ghana, estimated the prevalence at 2.5% (Lassey et al., 2004). Adjei et al, (2006) performed a cross-sectional study of prison inmates in two regional central prisons in Ghana and found that the HBV prevalence was 19%. In Ghana, Prisoners have been found to be part of the high-risk groups of hepatitis prevalence. How congested most prisons in the country have been, coupled with the fact that prison inmates are usually not screened before they start their prison sentence predispose them to HBV infection.

According to Sarkodie et al. (2015), HBV is endemic in Ghana with current sero-prevalence rates ranging from 6.7% to 10% in blood donors, 6.4% in pregnant women and 15.6% in children among the general population. In jaundiced patients the rate is 54.1%. Across the country currently, HBV



infection prevalence rates were recorded in persons within the age group 16–39 years to be 12.8% in a cross-sectional study conducted in the Ashanti Region of Ghana (Ofori-Asenso et al., 2016).

Hepatitis B is a major public health threat globally (WHO, 2012). Despite the fact that since 1982 there is a vaccine against HBV that gives 90–100% protection against infection, there are in the world today more than 350 million people living with chronic hepatitis B. The consequence of this is approximately 600,000 HBV related deaths every year around the world, where the cause is primary liver cirrhosis or liver cancer (Dunford et al., 2012; WHO, 2012).

Despite the long history of the disease in the country, there seems to be not much attention given to it by policy makers, health institutions, the general public and decision makers. Apart from the formation of the Ghana Hepatitis B Foundation (GHBF) which started its operation in September, 2007, there have not been any bold and pragmatic measures put in place to curb the disease in the country. In the light of the lukewarm attitude shown towards Hepatitis B and due to acts of selective prevention of infectious diseases by health professionals including HB, the disease is said to be spreading fast with an estimated number of four million people as carriers (Ghana Health Service [GHS], 2009).

National HIV prevalence is relatively low with 2.4% as an estimated rate as compared to an estimated prevalence rate of 12.8% for hepatitis B (Ofori-Asenso et al., 2016). Much attention is given to its prevention and treatment through health education programs and provision of anti-retroviral drugs to the neglect of equally deadly diseases like hepatitis B by Ghana

Health Service and other health related organizations. Meanwhile, few studies conducted in the country about HB revealed its continuous increase. In a hospital-based study conducted among blood donors, pregnant women and children among the general population revealed that HB is endemic in the country with prevalence rates ranging from 6.4% to 10% among blood donors, 6.4% pregnant women and 16% children among the general population respectively (Sarkodie, 2015; Abongwa & Kenneth, 2016).

Another hospital-based study conducted in two different hospitals in Jirapa and Tumu in the Upper West Region of Ghana by a Cuban Medical Brigade has shown that in 2009, 128 admitted patients were tested HBV positive and that majority of the cases were between the ages of 30-44 years (GHS, 2009). A hospital-based study of pregnant women in Accra the capital of Ghana, estimated the prevalence at 2.5% (Lassey et al., 2004). Adjei et al. (2006) performed a cross-sectional study of prison inmates in two regional central prisons in Ghana and found that the HBV prevalence was 19%. In a cross-sectional study of children aged 15 years and younger in the rural Ashanti-Akim North district of Ghana, Martinson et al. (1998) estimated the HBV prevalence at 5.4%. HBV infection prevalence was highest among studies published within the period 1995–2002 (17.3 %), followed by those published within 2003–2009 (14.7 %) and the lowest prevalence rate being recorded across studies published in the period 2010–2015 (10.2 %). Regional prevalence was determined for Ashanti, Greater Accra, Eastern, Northern, central and Brong-Ahafo regions as 13.1, 10.6, 13.6, 13.1, 11.5 and 13.7 % respectively. No aggregate data were derived for Volta, Western, Upper East and Upper West regions. Higher prevalence of HBV infection was attained for

rural (13.3 %) compared to urban settings (12.2 %). Across the country, currently, HBV infection prevalence rates were recorded in persons within the age group 16–39 years to be 12.8% (Ofori-Asenso et al., 2016).

There has also been an increase in the number of deaths associated with the disease in the country. In a 13-year hospital based study conducted in a rural district of Berekum in the Brong Ahafo region of Ghana to assess the role of indirect causes of maternal mortality among the 229 maternal deaths recorded during the period of review, 15 out of 229 deaths were due to HBV (Diederike et al., 2003). Again, unlike HIV/AIDS, malaria and tuberculosis that have gained much attention from both government and foreign donors and which has led to the inflow of monies for their activities, health education on HB activities are extremely limited (Dunford et al., 2012). There is no programme for mass screening and vaccination of children born before vaccine introduction, no screening for mothers, adolescents and the general public (Diederike et al., 2003).

### **Statement of the Problem**

It is an undeniable fact that although hepatitis B screening and vaccination is carried out in some few health facilities in Ghana, it is not a national policy and is not incorporated into national health policies like the free counseling and testing for HIV or the mass immunization of children against measles (GHS, 2012). Also, media publicity on the disease is not substantial as compared to other infectious diseases. According to Akumiah and Sarfo (2015), knowledge, attitudes and practices (KAP) studies conducted about educated people (Teachers inclusive) in the Asante Akim District (Ashanti Region) on viral hepatitis B is relatively poor.

However, Teachers are considered to be endowed with knowledge and seen as role models in any society or community (Nguyen et al., 2008). Thus when teachers are equipped with information with Hepatitis B, they would help in the campaign against Hepatitis B infection. Data gathered from Tafo Government hospital, Suntreso Hospital within the Kumasi Metropolis revealed that most teacher trainees tested positive to hepatitis B in health screening conducted. There is therefore the need to assess the knowledge, attitude and practices of these teacher trainees as far as hepatitis B is concerned.

### **Purpose of the Study**

The purpose of the study was to investigate: the knowledge, attitude and practices of teacher trainees in the Kumasi Metropolis on hepatitis B and its prevention and the relationship between teacher trainees' knowledge and their practices on the prevention of hepatitis B.

### **Research Questions**

This research sought to answer the following questions.

1. What level of knowledge do teacher trainees in Kumasi Metropolis have about Hepatitis B and its prevention?
2. What are the attitudes of teacher trainees in Kumasi Metropolis towards Hepatitis B and its Prevention?
3. What practices do teacher trainees in Kumasi Metropolis engage in order to prevent themselves from contracting hepatitis B?
4. What is the relationship between teacher trainees' knowledge and their practices on the prevention of hepatitis B?

### **Significance of the Study**

Reviewed studies have shown that having knowledge about Hepatitis B is important for preventing Hepatitis B infections and to have appropriate attitudes towards its prevention. This study would help improve the welfare of the citizens of the country and Teacher Trainees in particular. To use the research as an alarm blower in order to create awareness on hepatitis B prevention as a national health priority which will result in Non-Governmental Organizations (NGOs) and government's commitment to increase funding for HB prevention awareness, research and other related activities. This research would also be used as a mouthpiece to lobby for HBV immunization and treatment to be included under the current list of diseases being taken care of by the National Health Insurance Scheme or incorporate HB screening and vaccination into the voluntary counseling and testing of HIV to be done concurrently. Finally, the researcher hopes this study would stimulate further research studies in other colleges to know the knowledge, attitudes and practices student teachers have towards Hepatitis B prevention.

### **Delimitation**

This study focused on students at Colleges of Education in the Kumasi metropolis pursuing various diploma programmes. This comprised only the first and second year students who were residing in the various campuses. The study was also concerned with only the knowledge, attitude and practices of students towards Hepatitis B prevention. Despite other important areas such as stigmatization against hepatitis B patients, knowledge, attitudes and practices of trainee teachers regarding hepatitis B prevention was considered.

## **Limitations**

There were few limitations that need to be acknowledged, although painstaking efforts were made to acquire every bit of information needed to conduct this research.

First of all, getting access to students to answer questionnaire was very difficult as some of the Principals of the colleges proved rather difficult giving the researcher the opportunity to take data which delayed the gathering of data.

Again, some of the students were reluctant to answer some of the questions. They did not want to choose certain answers that will expose their ignorance to the researcher and their peers who sat closer to them. This may affect the validity of the study.

Finally, due to insufficient resources and time, third year students were not included in the study. Results from the third year students admittedly could have enriched the study if they were included in the study. Adding them to the study would have improved the reliability of the study since the sample size would have increased.

## **Organization of the Study**

The study was divided into five chapters. From chapter one, the rest were chapter two of the study which dealt with the literature review. The second chapter provided theoretical framework and empirical review on areas such as: meaning of Hepatitis B, signs and symptoms of HBV, origin, mode of transmission, prevention of HBV infection, knowledge, attitudes and practices of teacher trainees, sources of Hepatitis B information and the role of Hepatitis B education. Chapter three described the research methodology, provided

research design, the population, sample and sampling procedures, data collection instrument and procedures, data analysis and presentation. Chapter four discussed the findings from the data collected from respondents. Finally, chapter five provided summary, conclusions, and recommendations based on the findings from the study.

### **Definition of Terms**

**Knowledge** - Knowledge refers to the fact or condition of being aware of something or subject.

**Attitudes** - Attitude refers to the opinions and feelings that one has about something or subject.

**Practices** - Practice is carrying on professional working practice with integration to theory.

**Hepatitis B virus (HBV)** - HBV is a DNA virus that is transmitted by percutaneous injuries or per mucosal exposure to infectious blood products or other body fluids.

**Teacher Trainees** - Students pursuing Diploma in basic education programme at College of Education.

## CHAPTER TWO

### LITERATURE REVIEW

The purpose of this study was to investigate the knowledge, attitudes and practices of Teacher Trainees in the Kumasi Metropolis on hepatitis B and its prevention. The study also sought to ascertain the relationship between teacher trainees' knowledge and their practices on the prevention of hepatitis B. This chapter looked at the relevant theoretical framework and empirical review which formed the basis of the discussion on knowledge on Hepatitis B among teacher trainees and how this knowledge could influence their attitudes and practices towards the prevention of the disease. The main purpose of the chapter was to provide theoretical and empirical support for this study. Specifically, the literature review will deal with the following:

1. Meaning of hepatitis B disease and the virus.
2. Historical background of HBV.
3. Transmission Route of Hepatitis B.
4. Replication of HBV
5. Pathogenesis of HBV.
6. Stages of HBV infection
7. Signs and symptoms of the disease.
8. HBV Diagnosis.
9. Prevention HBV infection.
10. Treatment of Hepatitis B.
11. Prevalence of Hepatitis B.



12. Knowledge level of hepatitis B virus and infection.
13. Attitude towards hepatitis B prevention.
14. Practices of students towards HBV infection.
15. Theories of hepatitis B infection.
16. Conceptual framework of the study.

### **Meaning of Hepatitis B Disease and the Virus**

The etiological agent for the HBV was discovered in 1966 (Ocama et al., 2005). Hepatitis B infection is a major health problem with a characteristic geographic distribution (Halfon et al., 2005). Hepatitis B, caused by HBV is a serious liver disease. The disease's transmission is through human body fluids such as blood and serum. Worldwide, it is an alarming public health problem. Its methods of transmission include through mother-to-baby (perinatal), the use of improper injection techniques and sexual contact. The functional integrity of the liver could directly or indirectly be affected by Hepatitis B infection in the infected hosts (Altiparmak et al., 2005).

The liver, as a homeostatic organ, plays a pivotal role in modulating intracellular and extracellular cycles of lipid metabolism. It is involved in the sequestration, remodeling (synthesis or recycling), and redistribution of lipid metabolites, including lipoproteins such as very low-density lipoproteins (VLDL), low-density lipoproteins (LDL), high-density lipoproteins (HDL), and their corresponding apolipo proteins - ApoB, and Apo A1, triglycerides (TG), and total plasma cholesterol. Thus, the extracellular circulating levels of these lipids in plasma of hepatitis B-infected patients depend significantly on the functionality of the host liver (Altiparmak et al., 2005).

More than two billion amongst the population alive today would have been infected at some time or other in their lives by HBV and 350 million of them approximately are the carriers of the chronically infected disease (Kane, 2005). 25-30% out of these would die as a consequence of the infection (WHO, 2003). These carriers are at high risk of this serious illness and death from cirrhosis of liver and/or primary liver cancer would kill more than one million of them, per year. From generation to generation, they also constitute a reservoir of infected individuals, who perpetuate the infection.

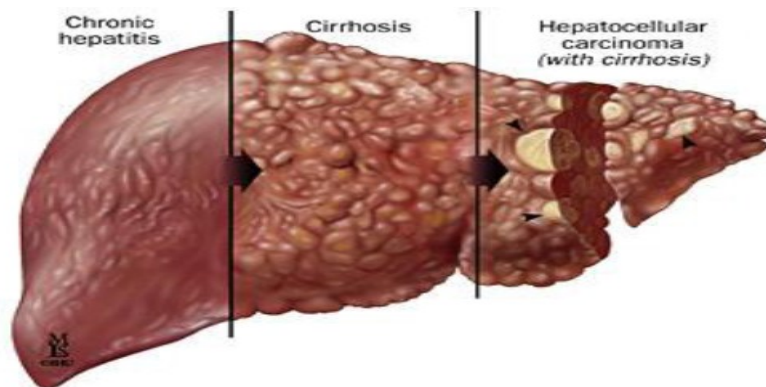
For most biomedical researchers over the past decade, the nature and extent of association of chronic hepatitis B disease and serum transaminases and lipid dysregulation has become the subject of interest. Dyslipidemia in liver diseases, as reported by most researchers, has been largely attributed to the decrease in the biosynthetic and bioprocessing capacity of the liver in the diseased state, as with chronic hepatitis B infection (Maynard et al., 2008). Reports on the profile of lipids in cases of liver diseases have been very diverse, showing slight to marked variations in plasma lipoprotein and apolipoprotein patterns. In one study of the dyslipidemia in chronic hepatitis, liver cirrhosis and hepato-cellular carcinoma (HCC), the TG and cholesterol levels decreased while LDL – cholesterol fraction increased with HDL-fraction remaining fairly unchanged (Altıparmak et al., 2005). Altogether, the increased LDL-Cholesterol and the normal plasma HDL-Cholesterol may pose increased cardiovascular risk to patients with liver disease.

Pathophysiologically, there are two main stages of chronic hepatitis B infection – chronic symptomatic and chronic asymptomatic stages with their attendant pathological manifestations (WHO, 2008). However, most studies of

chronic hepatitis B infection have not investigated the relationship of these stages on serum transaminases and lipid profile of infected hosts.

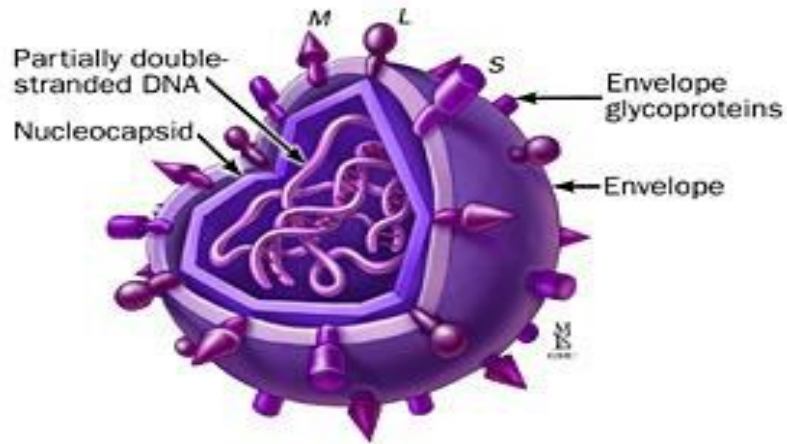


*Figure 1: Human Viscera Showing Liver (Altiparmak et al., 2005)*



*Figure 2: Progress of Hepatitis B Infection (Altiparmak et al., 2005)*

Hepatitis B is a DNA virus of the hepadnaviridae family of viruses. It is replicated within infected liver cells (hepatocytes). The hepatitis B virus particle (virion), also known as the Dane Particle, consists of an outer lipid envelope and an icosahedral nucleocapsid core composed of protein. This double stranded deoxyribonucleic acid (DNA) virus of the hepadnaviride family is the smallest DNA virus to infect humans (Kotzee et al., 2006).



*Figure 3:* Hepatitis B Virion (Kotzee et al., 2006).

Virions are 42nm in diameter and possess an isometric nucleocapsid or core of 27 nm in diameter, surrounded by an outer coat approximately 4nm thick. Protein of the virion coat is termed “surface antigen” or HBsAg. It is sometimes extended as a tubular tail on one side of the virus particle. The surface antigen is generally produced in vast excess, and is found in the blood of infected individuals in the form of filamentous and spherical particles. Filamentous particles are identical to the virion “tails” – they vary in length and have a mean diameter of about 22nm. The outer surface coat surrounds an inner protein shell, composed of HBc protein (hepatitis-B core protein) or HbcAg (hepatitis B core antigen). This inner shell is referred to as the core particle or capsid. Finally, the core particle surrounds the viral DNA and the enzyme, DNA Polymerase (Kotzee et al., 2006).

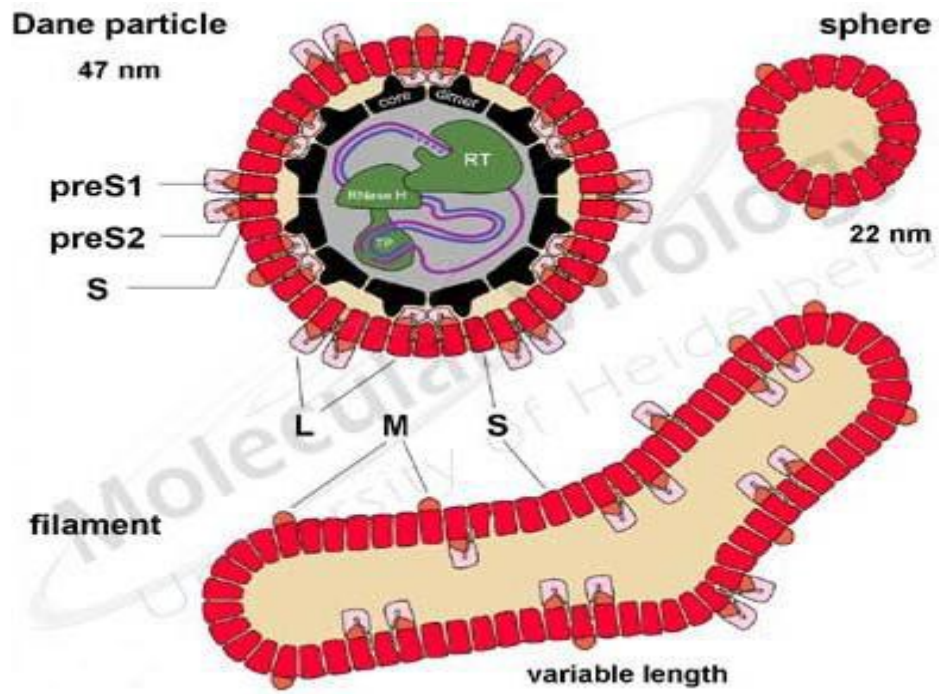


Figure 4: Detailed Structure of Hepatitis B Virion (Kotzee et al., 2006).

### Historical Background of HBV

The breakthrough understanding of hepatitis came in 1963 when Dr. Baruch Blumberg discovered an antigen that detected the presence of hepatitis B (HBV) in blood samples. Dr. Blumberg was actually researching the genetics of disease susceptibility at the time. He did not set out to discover hepatitis, but his work led to a major breakthrough and increased understanding of the disease. Dr. Blumberg started to explore whether inherited traits could make different groups of people more or less susceptible to the same disease in the 1950s. Visiting native populations in remote locations he and his team travelled around the world to collect blood samples for analysis. The intention was to look for genetic differences to see whether these differences were associated with a particular disease. Specifically, they studied hemophiliac patients who had received multiple blood transfusions

and therefore would be exposed to blood they had received from donors (Blumberg et al., 1965)

The consequence of receiving other people's blood is that the immune system produces 'antibodies' against the foreign blood serum proteins, or 'antigens' from the donors. Dr. Blumberg and his team identified an unusual antigen from a blood sample of an Australian Aborigine, which they called the Australia antigen. After further research, this turned out to be the antigen that caused hepatitis B, which was officially recognized in 1967. The hepatitis B virus was discovered in 1965 when Blumberg and co-workers found the hepatitis B surface antigen, which was originally called the Australia antigen because it was found in serum from an Australian patient (Blumberg et al., 1977: 1965). Dr. Baruch Samuel Blumberg was awarded the 1976 Noble Prize in Physiology or Medicine for this discovery. The virus was fully described in the 1970s (Dane et al., 1970). In recent times, the rapid and continuous discoveries of the viral disease around the whole world have improved our understanding of the complexity of this unusual virus. Although there has not been any substantial decrease in the overall prevalence of HBV, there is the hope that the next generation will see a decline in both the worldwide carrier rate and the incidence of new HBV infections if current HBV vaccinations are intensified.

### **Transmission Route of Hepatitis B**

Yoder (2007), stated that HBV may be transmitted horizontally and vertically. Horizontal transmission occurs during adolescence or childhood, throughout sexual exposure, needle stick (both accidental or through intravenous drug use), and blood transfusion (Alter et al., 2000). Therefore,

anybody with multiple sexual partners, bad history of sexually transmitted diseases (STDs) or an injecting drug user stands a higher chance of being infected with HBV (CDC, 2002). Exposure to blood is also by means of open wounds in households, other close contacts, and multiple transfusions in hemophiliacs (Goldstein et al., 2000). This view of exposure to risk was also shared by Margolis et al. (2000) who argued that most of the infections occur among adolescents and young adults due to exposure to high risk activities they engage in at this stage of life.

When an infected mother transmits the virus directly to the neonatal during childbirth a vertical transmission occurs. Transmissions of such nature are usually made possible when the expectant mother suffers an acute infection of hepatitis B during pregnancy or if she is a chronic carrier during that period. The mode of this vertical transmission is not clear-cut, but indications are that during childbirth infection might occur through the cutting of placenta (Dore et al., 2007). Majority of countries in Southeast Asia, the Western Pacific and Africa have high endemicity of HBV. The major mode of HBV transmission in these settings has been identified as vertical, where by mothers directly transmit virus to their infants during prenatal periods or where infected siblings, playmates, other members of different households transmit the virus to their younger ones (Maynard et al., 2008). A cross sectional study by Margolis et al. (2001) explained that without prophylaxis, as a consequence of prenatal transmission an estimated number of 6000 infants born to carrier mothers each year in the USA would develop chronic HBV infection.

Apart from the above mentioned major modes of transmission, tattooing and body piercing tools have been recently discovered to contribute significantly to the spread of the disease. The incidence of reported hepatitis B in different age groups in the USA is indicative of a life style disease linked with at-risk behaviour in late adolescence (15-19 years) and young adulthood (20-29 years). The disturbing risk factors are mostly sexual misconduct, tattooing, body-piercing, drug use or injection (CDC, 2006). In less developed countries, the use of crude methods during injections such as reused unsterilized or improperly sterilized needles and syringes are estimated to cause millions of cases of hepatitis B and C as well as HIV and other blood borne diseases globally (Kane, 1998).

The source of most chronic infection in many countries is perinatal infection from mothers who are HBsAg positive with or without HBeAg positivity (ADHS report, 2012). Though small, transmission of hepatitis B in Ghana during the neonatal period of children is significant and may account for the high chronic endemicity of the viral infection in the country (Ghana EPI profile, 2002). The presence of HBeAg in the blood of mothers increases the risk of transmission from 5%-31% in HBsAg positive but HBeAg negative mothers (Alter et al., 2006, Beasley et al., 2007) to about 70%-90% in HBsAg positive and HBeAg positive mothers (Hou et al., 2005, Ott et al., 2012b). HBV DNA was found in children from HBsAg positive mothers even though the children are positive for anti-HBs. Thus occult HBV infection occurs in vaccinated infants (Su et al., 2013).

Despite increasing number of at risk children born in the United States, perinatal hepatitis B prevention programme is making progress in preventing a



lot of perinatal infection (Smith et al., 2012) Seventeen babies out of 204 carrier mothers were infected through maternofetal transmission when paired mother-cord blood or new born whole blood was tested for HBsAg and HBV DNA in the middle belt of Ghana (Candotti et al., 2007). In the northern part of the country anti-HBs response was determined for infants to reach at least 87% (Hodgson et al., 2008). Another study in the section of the country also showed that vitamin A did not have any impact on the affinity of anti-HBs for the studied vaccine.

### **Replication of HBV**

Even though evidence is available that the virus can replicate in the kidney and pancreatic cells, replication mostly occurs in the hepatocytes. There has not been any evidence linking replication in these organs to the establishment of disease (Candotti et al., 2007). HBV is replicated through pregenomic RNA intermediate reverse transcription (Beck & Nassal, 2007) making them quite related to retroviruses but with a major difference, that is, HBV is a DNA virus while the retroviruses are RNA. It is thought that infectious virions pass through the liver sinusoid's fenestrations contained in the cytoplasmic components of the liver sinusoid endothelial cells through the space of Disse just adjacent the hepatocytes (CDC-MMWR, 2006). The virion interacts from there with other unknown specific receptors sites on the susceptible cells (hepatocytes) leading to attachment and binding by means of the PreS1 domain, subsequently penetrating the hepatocytes (Beck & Nassal, 2007; IARC, 2012). It uncoats releasing partially double-stranded relax circular DNA into the cytoplasm. This is then transported into the nucleus and cellular enzymes synthesize DNA to complete the uncompleted strand

converting it to covalent closed circular DNA (ccc DNA) (Beck & Nassal, 2007).

The cccDNA serves as the template for the production of HBV messenger ribosomal nucleic acids (mRNAs) including a 3.5-kb RNA pregenome. The pregenome and a viral polymerase protein (with HBV reverse transcriptase and RNase H activity) are encapsidated forming newly synthesized core particles (Beck & Nassal, 2007, Butel et al., 2006). Using the RNA pregenome as template, the reverse transcriptase synthesizes the negative strand within the capsule while the RNase removes the RNA pregenome template (Butel et al., 2006). A complementary strand to the negative strand (positive DNA strand) is synthesized but the synthesis does not proceed to completion within the core, resulting in replicative intermediates consisting of full-length minus DNA strand and a positive DNA strand of variable-length about 20% – 80% complete (Brooks et al., 2007).

Core particles (nucleocapsids) containing these DNA replicative intermediates with a relaxed circular DNA may bud from pre-Golgi membranes (acquiring HBsAg in the process), exiting the cell as a virion. The nucleocapsid may re-enter the intracellular infection cycle migrating to the nucleus (Brooks et al., 2007). There, it will deliver the freshly produced viral nucleic acid into the nucleus of the host hepatocytes causing a great increase in the cccDNA leading to the production of more nucleocapsids (Beck & Nassal, 2007, Brooks et al., 2007, Butel et al., 2006) as demonstrated in figure 1- 3 below. Amplification of cccDNA resulting in new and repetitive replication cycles produces varied hepatitis B viral genotypes, sub-genotype and strains (Norder et al., 2004).

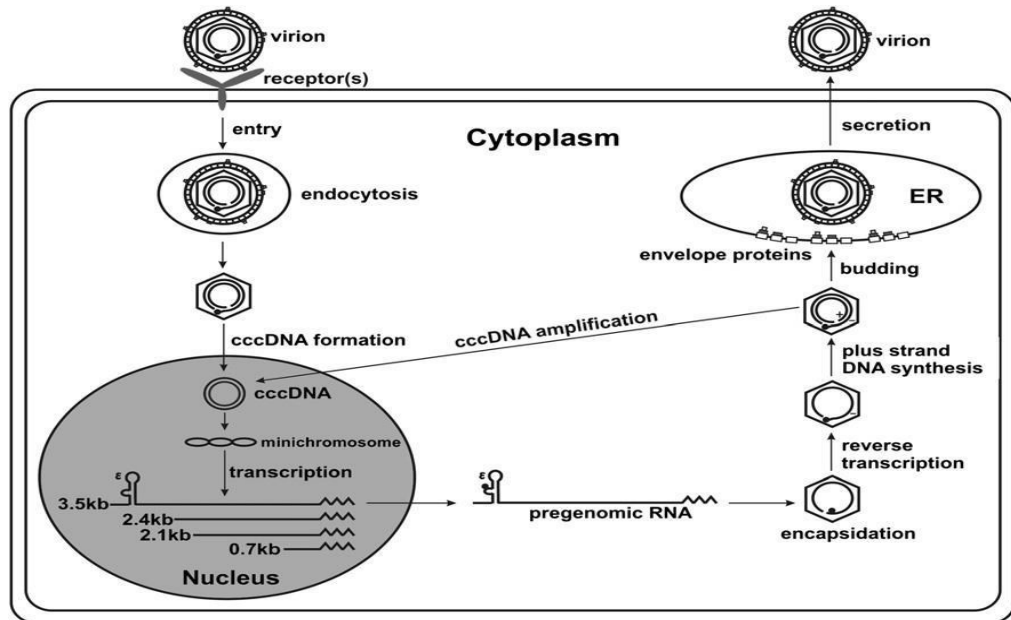


Figure 5: Schematic Replication Cycle of HBV (Block et al., 2007).

For most of the time since the discovery of HBV, its replication pattern was unknown or ignored until it was recently compared with the replication pattern of hepatitis C virus (HCV), where its irregular replication pattern was brought to the fore. While HCV immediately starts replication upon entering the hepatocytes, HBV take quite some time about 4-5 weeks after infection to show exponential replication of HBV DNA (Bertoletti & Gehring, 2006, Thimme et al., 2003).

### Pathogenesis of HBV

HBV gains entry into the body of its host through breaks in the skin or mucous membrane and remains usually unnoticed to the innate immune system as it spreads from one hepatocyte to the other in the liver until the onset of the adaptive immune system response several weeks after infection (Chisari et al., 2010). The virions, after gaining access to the circulatory system through a bridge of the skin or mucous membrane are transported to the liver which is the preferred site to cause infection to the hepatocytes.

According to (Le Seyec et al., 2009), an infected hepatocyte generally becomes large and its cytoplasm has a ground glass appearance. The large proteins of the PreS1 domain of the proteins coat which contain amino acid of sequence 3-77 is believed to be crucial in the infection stage and may be used in binding and adsorption of the viral particle on to hepatocytes (Le Seyec et al., 2009). Some evidence according to (Neurath et al., 2002), suggest however that receptors may be found on extra-hepatic cells such as B lymphocytes, T cell lines, monocytes and peripheral blood lymphocytes. Also, that HBV- cell interaction is mediated by interleukins, an example is interleukin 6. Research have produced evidence that carboxypeptidase D serve as the receptors for the duck hepatitis B virus (Coffin et al., 2011), but not for HBV even though the two viruses share a lot of similarities in their genome. The adaptive immune response is responsible for clearing viral particles and also for the pathogenesis of HBV infection (Chisari et al., 2010). The viral particles floating in the blood system are cleared by the humoral immune response and restrict their spread, while the T cell immune response eliminates the host cells that have been infected with the virus. When the virus is successfully cleared in acutely infected persons, the T cell response is usually vigorous, polyclonal and multi-specific. It is however weak and narrowly focused in chronically infected individuals giving strong support to the assertion that HBV clearance is T cell dependent (Chisari et al., 2010). The viruses replicate non-cytopatically within the hepatocytes within a time period of 30 to 180 days and 90 days on the average. Damage to hepatocytes is due to the adaptive immune response, mainly through virus-specific Cytotoxic T Lymphocytes (CTL) response which plays an important role in both liver

pathology and viral clearance due to immune response to the viral antigens on the surfaces of infected hepatocytes (Iannacone et al., 2007, Cheruvu et al., 2007).

Observations have also shown that CTL induced liver disease is enhanced by antigen-nonspecific inflammatory cells. It is known also now that platelets mediate the accumulation of CTL in hepatocytes, thereby promoting viral pathogenesis in the liver (Iannacone et al., 2007). The resolution of infections usually takes few months to some few years after acute infection. Chronic hepatitis B development depends on the mode of transmission, the immune system status of the individual at time of exposure and the age at which the infection occurs. The pathological process that brings about cirrhosis may be carcinogenic without the direct involvement of the virus (Iannacone et al., 2007). Studies have shown a positive correlation between hepatitis B infection and liver cirrhosis which is an end stage and a chronic irreversible disease of the liver that affects mostly people living in hepatitis B endemic areas. Going by the natural history of hepatitis B infection and its consequence, 10%-33% of people who get infected become persistently infected and about one-quarter to one-half of them will have their conditions degenerating to cirrhosis (Blankson et al., 2005). Studies by Edington in 1957 and from unpublished information from the Pathology Department, Korle-Bu teaching Hospital indicate liver cirrhosis is the leading cause of death from liver diseases in Accra (Blankson et al., 2005). Blankson et al established a strong association between liver cirrhosis leading to death of patients and HBV infection in Accra.

Chronic HBV infection is a risk factor for developing HCC and those at high risk are adult males and chronic hepatitis B patients presenting cirrhosis. HBV carriers show 98 fold increase risk of developing HCC as compared to their non-carrier counterparts (Venook et al., 2010). The risk is much greater for those carriers who are HBeAg positive even though the carriers with HBeAb also has substantial risk of reverting to HBeAg positive state and developing HCC (Ganem & Prince, 2004, Lavanchy, 2004). About 15% -40% of chronic HBV patients will usually develop HCC, liver cirrhosis, or liver failure (Lavanchy, 2004). Just about 5% of patients with cirrhosis develop HCC, while about 60% -90% of HCC patients will usually have underlying cirrhosis (Remis et al., 2000). There is no specific oncogene sequence that is known to be responsible for the tendency of patients with cirrhosis to progress to HCC. The tumour responsible for HBV related HCC develop from chronic liver inflammation and repeated regeneration of hepatocytes after several years (about 25-30 years) of HBV infection (Lee, 1997, Mahoney, 1999). HCC is ranked 7th and 9th most common cancer in males and females respectively worldwide with over 500, 000 people dying annually due to HCC of which the male to female ratio is 4:1. The incidence of HCC varies with geographical location, race, sex and age (WHO, 2008)

### **Stages of HBV Infection**

Remarkable progress has been made in the understanding of the three (3) main natural stages of the HBV infection in hosts: acute infection, chronic asymptomatic and chronic symptomatic stages (AASLD, 2007). Not all HBV-infected patients however go through all the three stages. The risk of developing liver-related complications, such as cirrhosis and hepatocellular

carcinoma increase as patients progress from acute to chronic stage of the infection. Indeed, most HBV infections end up at the acute stage (~ 90%) with a few progressing on to the chronic stage (ibid).

**1. Acute HBV Infection:** Even though not all patients transit beyond this stage, it is the initial stage of the infection and every HBV- infected patient goes through it. Early phases of this stage of the infection are characterized serologically by the presence of HBsAg, high serum HBV DNA, HBeAg, and normal level of serum aminotransferase level (ALT), and minimal or insignificant inflammation on liver biopsy (Altiparmak et al., 2005). A later phase, also called immunity phase, is marked by increased serum titres of anti-HBsAgIgG (HBsAb), anti-HBcAgIgG, lowered or disappearance of HBsAg and HBV DNA, normal liver histology (ibid). This is true for those who recover fully from the infection after attaining full and permanent immunity through exposure. In either phase, the duration differs among patients but generally lasts between 5 - 8 months (AASLD, 2007). Patients who fail to mobilize adequate immune response factors to combat the infection however end up with the fate of living with the disease their entire lifetime. In this case, it is said the disease has become chronic. The physical signs and symptoms, such as jaundice, fever, dark-urine formation, nausea, among others, would occur, even though they will last shortly after which they get resolved following recovery. Generally, transition from the acute stage to the chronic stage depends on several factors including: age, gender, viral genotype, and host immune competence (ibid).

**2. Chronic HBV infection:** The chronic stage is a progression of the early phase of the acute HBV infection due to the host's failure to mount the

necessary immunity to ensure total viral clearance and consequent resolution of the disease. It is serologically marked by relative rise in serum anti-HBcAgIgG, disappearance or lower titres of anti-HBsAgIgG, and either normal or significant liver damage as shown by ultrasonography (WHO, 2008). Also, this stage of the disease may be characterized by normal or elevated serum aminotransferase levels, aspartate aminotransferase (AST) and alanine aminotransferase (ALT) (AASLD, 2007). Under this chronic HBV stage, infected patients fall into one of the two pathologically progressive forms, namely:

**a) Chronic Asymptomatic:** This is characterized by:

- i. Presence of HBsAg in serum
- ii. Anti-HBsAgIgG (HBsAb) positive
- iii. Normal liver histology indicated by apparently normal ALT levels
- iv. Relatively lower viral load ( $<10^3$  copies/ml) (AASLD, 2007)

**b) Chronic Symptomatic:** This is characterized by:

- i. Presence of HBsAg in serum
- ii. Anti-HBsAgIgG (HBsAb) positive
- iii. Relatively higher viral load ( $>10^3$  copies/ml),
- iv. Significant damage on liver histology, showed by elevated ALT levels (AASLD, 2007).

At the chronic symptomatic stage, patients may show mild to severe liver cirrhosis. Complications are developed at the terminal stage of liver damage and is accompanied by hepatomegaly, lower abdominal bleeding, elevated serum endogenous mercaptans, hepatic encephalopathy, hepatic coma, membranous glomerulonephritis (Lok & McMahon, 2007). The



serological presence of HBeAg is real in all stages of the disease. The presence of this antigen together with elevated viral load (HBV DNA > 10<sup>3</sup> copies/ml) and higher ALT (> 60 IU/l) is a strong indication of viral activity, replication, and infectivity (WHO, 2008). Patients with such manifestations are put on retroviral. A key event in the natural history of HBeAg-Positive CHB patients is HBeAg seroconversion (McMahon et al., 2000; Sharma et al., 2005). It is believed that sero conversion of HBeAg to HBeAb is accompanied with cessation of HBV replication and remission of liver disease.

Several studies have shown that seroconversion with a marked reduction in HBV replication is associated with biochemical and histological remission of inflammatory activity in the majority of patients (Elghouhari et al., 2008; McMahon et al., 2005; Sharma et al., 2005). Some studies showed that the mean annual rate of spontaneous HBeAg seroconversion ranges from 8% - 15% in children or adults with an elevated ALT level (McMahon, 2005; Sharma et al., 2005). Although the ALT level is normal in most Asian children, their spontaneous HBeAg seroconversion rate is less than 2% during the first 3 years of age and then increases to 4%-5%. In some cases, spontaneous recurrence of hepatitis is not frequently recognized because it is usually asymptomatic. Since subsequent HBeAg seroconversion would not occur in such situations of hepatitis, it can thus be viewed as an abortive attempt at seroconversion (ibid). However, regression of fibrosis occurs several months or years after HBeAg seroconversion (McMahon et al., 2000).

The recurrence of hepatitis may precede the disappearance of HBeAg and development of HBeAg antibody, culminating in the remission of hepatitis activity (Chan et al., 1999; Furusyo et al., 2002). Tsai et al. (2002),

revealed that absence of HBeAg could rather be indicative of viral dormancy/hibernation. Although a high serum DNA level in patients with liver disease with minimal or no inflammation is considered as a sequela to immune tolerance to HBeAg, it has been shown that HBeAg may promote HBV chronicity by functioning as an immunoregulatory protein (Milich & Liang, 2003). Such a mechanism may be responsible for the high chronic HBV infection rate (~ 90%) observed in babies infected by their HBeAg – positive mothers, accounting for the inability of infants to clear perinatal HBV infection. HBeAg can also enter thymus.

It has been reported that HBeAg specific Th2-like cells can preferentially survive tolerance production to a greater extent than HBeAg – specific Th1-like cells (Huang et al., 2006). Therefore, chronicity resulting from vertical transmission of HBV, characterized by the predominance of HBeAg - specific Th2-like cells and secretion of anti-inflammatory cytokines, such as IL-4, IL-5, and IL-10, can enhance antibody production, and viral persistence would characterize the HBeAg specific T-cell response. Presence of HBeAg and absence of the HBeAb increases a patient's risk of developing liver – related complications, such as cirrhosis, fibrosis, carcinoma, etc.

### **Signs and symptoms of Hepatitis B**

The incubation period averages six weeks, but may be as long as six months. About 30% of persons show no sign or symptoms. In children, Signs and symptoms are less common than in adults. Compared to adults however, a large proportion of children may become chronic carriers. Any common symptoms that might show up are usually flu-like symptoms, including fever, fatigue, muscle or joint pain. Severe symptoms include yellow eyes and skin

known as jaundice and a bloated or swollen stomach. These symptoms may last several weeks or months. A laboratory blood test is required for confirmation.

A complete recovery proceeds most acute infection in adults. However, many children become chronic carriers. People, who recover from acute hepatitis and not becoming chronic carriers, are protected from being infected again throughout their lives. However, to a limited number of the population, the acute infection could be severe and lead to death. The most serious complications including chronic hepatitis, cirrhosis, liver failure, and liver cancer, occur in people with chronic infection.

### **HBV Diagnosis**

The tests, or assays, for detection of hepatitis B virus infection involve serum or blood tests that detect either viral antigens (proteins) or antibodies produced by the host. Interpretation of these assays is complex (Bonino & Maran, 1987). In identifying patients with chronic HBV infection, the first step is to screen those with risk factors. Screening is focused on patients in high-risk groups, such as persons born in endemic areas, dialysis patients, injection drug users, patients engaged in high-risk sexual behaviours, HIV-infected and other immune suppressed patients, pregnant women, and persons with occupational exposure, as well as family/household members and sexual contacts of HBV-infected persons.

To screen for the presence of this infection, the hepatitis B surface antigen (HBsAg) is most frequently used. Testing for antibody to hepatitis B core (anti-HBc), and antibody to hepatitis B surface antigen (anti-HBs) indicate whether an individual has been previously exposed to HBV. The

HBV DNA levels are not required for preliminary screening for the HBV-infection. During an infection, the HBsAg is the first detectable viral antigen to appear. However, the length of time within which detectable amount of HBsAg may persist in host depends on efficiency of host immune function at clearing the virus-infected hepatocytes and establishing enduring immunity (AASLD, 2007). When infection has moved to the chronic stage of the infection this antigen may persist.

The molecular mechanism underlying this adaptation remains unknown yet. The infectious virion contains an inner "core particle" enclosing viral genome. The icosahedral core particle is made of 180 or 240 copies of core protein, alternatively known as hepatitis B core antigen, or HBcAg. During this 'window' in which the host remains infected but is successfully clearing the virus, IgM antibodies to the hepatitis B core antigen (anti-HBcIgM) may be the only serological evidence of disease (ibid). Individuals who remain HBsAg positive for at least six months are considered to be hepatitis B carriers (Lok & McMahon, 2007). As revealed by biopsy, carriers of the virus may have chronic hepatitis B, which would be reflected by elevated serum alanine aminotransferase levels and inflammation of the liver.

Carriers who have seroconverted to HBeAg negative status, particularly those who acquired the infection as adults, have very little viral multiplication and hence may be at little risk of long-term complications or of transmitting infection to others (Chu & Liaw, 2007). Additionally, polymerase chain reaction (PCR) tests have been developed to detect and measure the amount of viral nucleic acid in clinical specimens. These tests measure viral

loads and are used to assess a person's infection status and to monitor treatment (Zoulim, 2006).

### **Prevention of HBV infection**

We should be reminded by the good news that HBV is the only STD that can be prevented by vaccination even though it has become a major source of health concern worldwide (CDC, 2002). In recent years, the prevention of HBV globally, has become one of the topmost priorities of major political actors and decision makers. The disease is prevented by the use of safe and effective vaccine which became available in 1982 through funding and implementation of hepatitis B immunization programs. Before the advent of the vaccine, measures for HBV prevention had been geared towards avoidance of unsafe blood exposure or blocking of transmission (WHO, 2002).

The enactment of a law for the donation and management of blood in blood banks across the world has aggressively fought this channel of HBV transmission. This notwithstanding, current researches have showed that blood transfusion is regaining its position as one of the major risk factors for HBV transmission globally. This finding is attributed to the presence of occult HBV infection (OHBVI) among blood donors (Shang et al., 2007). It is also worth mentioning that the global acceptance of the auto-disposable syringes (ADS) has considerably reduced the incidence of HBV infections that occur due to unsafe injections. Again, iatrogenic HBV infections are no longer frequent as a result of the extensive use of invasive medical procedures. There have also been speculations that dental care operations which are capable of causing oral

mucous membrane injuries is becoming a major route to HBV transmission if steps are not taken to prevent it (Zhang et al., 2008).

Prevention strategies include primary prevention of new infections (i.e. vaccines and post exposure prophylaxis), secondary prevention of HBV transmission by appropriate sexual and sanitary practices, and tertiary prevention of the pathological consequences of chronic HBV infection by anti-viral treatment. The risk of progression from acute to chronic infection is inversely proportional to the age of infection. Up to 90% of infants who acquire HBV infection from their mothers at birth become chronically infected, whereas in adults, only 5% of acute HBV cases remain chronically infected (McMahon et al., 2005). Thus, the highest risk of developing chronic HBV is in high endemic areas where perinatal and early childhood infection is most common, making universal immunization the highest yield strategy for prevention. According to model-based predictions, universal HBV infant immunization would prevent up to 75% of global deaths from HBV-related causes. Adding a birth dose, where the first dose of HBV vaccine is administered within the first 24 hours of birth, would prevent perinatal transmission in up to 84% of infants (Goldstein, 2005). Safe and effective HBV vaccines have been available since the 1980s. The plasma-derived HBV vaccine was first commercially available in the United States in 1982, and continues.

HB in itself does not have a permanent treatment; hence, prevention is the surest antidote to the global epidemic. Even though two therapeutic agents such as interferon-alpha (IFN $\alpha$ ) and lamivudine are currently used by many countries for the treatment of the disease there has not been any universal

agreement on drugs used for the temporary treatment of the HB in the world. According to Sen and Ransohoff (2003), Interferon-alpha is a potent cytokine with antiviral and immune modulating actions which is produced in response to viral infection. Temporary treatment of the disease is therefore aimed at suppressing viral replication, reducing the risk of progressing to advanced liver disease or inflammation of the liver and the development of complications such as liver failure or liver cancer. Chronic hepatitis B is therefore easily managed rather than treated. Some of the general management strategies for HBV recommended by medical experts include;

1. **Avoidance of:**

- a) Heavy alcohol consumption.
- b) Unprotected sexual intercourse with partners who are not vaccinated.
- c) Sharing of needles or other items that potentially contain blood such as shavers or toothbrushes
- d) Donation of blood or organs
- e) Screening of family members and sexual partners for HBV infection and vaccination of those who are seronegative.
- f) Patient education and long-term follow-up with regular testing of liver biochemistry and surveillance of hepatocellular carcinoma in high risk groups. It is essential that consistent application of these measures be adhered to in any health care delivery to protect both the patient and HCW.

2. **Gloves:** The gloves are worn to provide a protective barrier to prevent contamination of hands when touching blood, body fluids, secretion, excretion, mucous membranes and non-intact skin. The gloves are

worn to reduce the risk of exposure to blood borne pathogens, transmission of microorganism present on hands of HCW to patient. However wearing gloves does not replace the need for hand washing, since gloves may have small, unapparent defects or may be torn during use and hands can become contaminated during removal of gloves (Satekge, 2010).

3. **Gowns:** They are worn to prevent contamination of clothing and to protect the skin of HCWs from blood and body fluid exposures. HCWs wear gowns during the care of patients infected with pathogenic microorganisms and where there could be splashes of human blood and body fluids. This is done to reduce the opportunity for transmission of pathogens from the patient to the environment (Satekge, 2010).
4. **Shoe Covers:** Leg coverings, boots or shoe covers provide greater protection to the skin when splashes or large quantities of infected material are present or anticipated (Satekge, 2010).
5. **Mask, Goggles and Face Shield:** These are worn alone or in combination to provide a barrier protection during procedures that are likely to generate splashes of blood or body fluids (Satekge, 2010).
6. **Hand Washing:** In addition to using barriers, hand washing is the single most effective measure to reduce transmitting microorganisms to patients or HCWs. Hands should be washed promptly and thoroughly between patient contacts and after contact with blood, body fluids, secretions, excretions, and equipment contaminated by them (Satekge, 2010)



7. **Safer Medical Devices:** This includes needless devices and not using needles where safe and effective alternatives are available, avoiding recapping needles and disposing of needles promptly in appropriate sharp disposal containers. HCWs should report potential hazards from needles and help their facility to select and evaluate safety devices. Needle stick injuries or other exposures to blood or body fluids should be reported immediately to ensure appropriate follow up (Satekge, 2010).
8. **Isolation:** Contact precautions are designed to reduce the risk of transmission of pathogenic organisms. Patients' should be placed in private rooms or room with a patient who has active infection with the same microorganism. HCWs should wear clean gowns, gloves, and masks, and equipment used should be thoroughly cleaned and disinfected before used on another patient (Satekge, 2010).
9. **Post-Exposure Prophylaxis:** Following exposure to potentially HBV-infected body fluids, the exposed part of the body should immediately be washed with water and soap. The source patient must be tested for HBsAg, and if the HBV status of the HCW is unknown, the HCW should be tested for both HBsAg and anti-HBs (Preboth, 2002). If the exposed HCW is found to be anti-HBs negative, he / she should be given hepatitis B immunoglobulin G (HBIGG), followed by initiation of the HBV vaccine series for both unvaccinated HCWs and HCWs who are vaccinated but are non-responders (Kotzee, 2006).

## **Treatment of Hepatitis B**

Acute hepatitis B is self-limiting and those cases require no treatment in majority of patients. Less than 1% of cases require treatment for fulminant hepatitis and symptoms such as vomiting, nausea, anorexia. The main target in the management of chronic hepatitis B is to eliminate infectivity by stopping the replication of the viruses to prevent the infection of susceptible people and also to stop the degradation of the liver of the patient and to improve prognosis of the disease.

Hepatitis B can either be treated with antiviral drugs (nucleotide and nucleoside analogues, protein inhibitors, etc.) to stop viral replication or can be treated with immune modulators which boost the immune system to offer better resistance to the virus (Ashor, 2011). Interferons with antiviral, ant-proliferative and immune modulatory properties are used to treat chronic hepatitis B. These interferons are to boost early maturation of B lymphocytes, enhance T helper cell activity and boost type 1 HLA expression (Ashor, 2011, Lavanchy, 2004, Malik & Lee, 2000). Some of the treatments and methods of managing hepatitis B disease is available for patients in Ghana, but they are expensive to obtain.

Many studies to find treatment for hepatitis B are in progress. In some of these studies chronic hepatitis B patients are inoculated with vaccines that have multiple antigenic components. Others are using DNA vaccines only for inoculation of the patients or a combination of the DNA vaccines and immune modulatory cytokines or yet, other studies have the genetic constitution of antigen presenting cells directly change (Zuckerman, 2006). If vaccinated after exposure to HBV, the vaccine still prevent development of disease due to the

delayed kinetics of the viral replication which result in delayed humoral and cellular immune response (Bertoletti & Gehring, 2006).

The onset of the HBV infection is insidious and is accompanied by the darkening of urine and pale stools. The Onset of symptoms in children is more abrupt with the icteric phase being shorter. After the onset of illness, recovery normally takes 6 to 12 weeks. A very small proportion of infected individuals about 0.5% -1% presenting with acute hepatitis B develop fulminant hepatitis and consequently die from liver failure (Kayser et al., 2005). While development of chronicity reduces as age increases, mortality in acute HBV infection increases with age.

There are four medications currently approved by the Food and Drug Administration (FDA) for treatment of chronic hepatitis B infection.

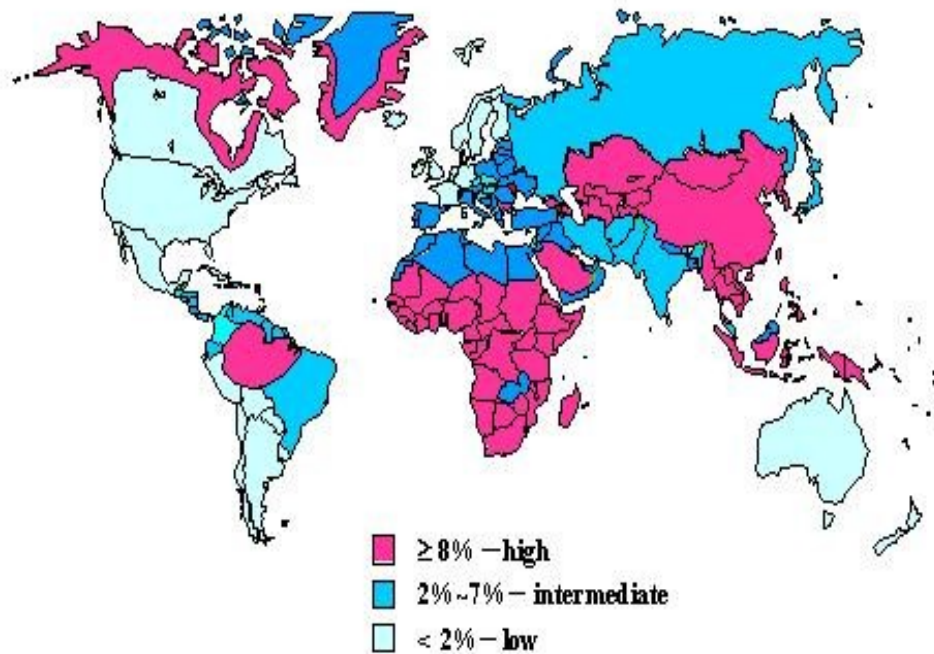
- 1. Interferon-alpha-2b:** Interferon-alpha 2b was first shown to be effective in chronic hepatitis-B virus patients in 1988. In addition to its direct anti-viral effects, interferon works against hepatitis B virus by stimulating the body's immune system to clear the virus (Benhamou et al., 2001). For the treatment of chronic hepatitis B, a four to six month course of interferon-alpha is given.
- 2. Lamivudine:** In the last five years, the focus of treatment for chronic hepatitis B virus has turned to nucleoside drugs. A number of nucleoside drugs that are used to treat HIV by slowing down the reproduction of that virus, therefore, have been tried for the treatment of hepatitis B virus. Nucleoside drugs are man-made molecules that closely resemble the biochemical units that make up genetic material (DNA and RNA). The nucleosides, therefore, work as imposters to

trick hepatitis B virus genetic material and thereby slow down reproduction (Hadziyannis et al., 2003). Unlike interferon, the nucleoside class of compounds has no known direct effect on the immune system.

- 3. Adefovirdipivoxil (Hepsera):** Adefovir (ADF) is a nucleotide analogue that on average reduces HBV DNA levels to 3.5 log<sub>10</sub>copies/ml after 48 weeks of therapy in HBV mono infected patients (Hadziyannis et al., 2003), but is less potent than Tenofovir (TDF). Only one of these studies has reported use beyond 48weeks (Benhamou et al., 2001); in that study 25% achieved undetectable HBV DNA (400copies/ml) by week 144 and no breakthrough or ADF resistant mutations were observed. ADF dosage ranges from 10mg every 48hrs to 10mg every 7days depending on the kidney functioning status. It inhibits DNA polymerase activity and reverse transcriptase. This drug is administered orally on a daily basis and is typically well tolerated (Benhamou et al., 2001).
- 4. Baraclude (Entecavir):** is the latest drug approved by the FDA for treatment of chronic hepatitis B. It works by inhibiting the function of Hepatitis B virus polymerase. Side effects include headache, fatigue, dizziness, nausea, and transient elevation in liver enzymes (Benhamou et al., 2001). This drug is taken orally, once daily and the optimal duration of therapy is not yet established. In patients with severe liver dysfunction, a liver transplant may be required.

## Prevalence of Hepatitis B

The WHO classifies areas of the world where the prevalence of HBsAg is  $>8\%$  as highly endemic, areas with prevalence of HBsAg from  $2\%$ - $7\%$  and  $<2\%$  as intermediate and low endemic areas respectively. The Figure below indicates the parts of the world with their corresponding HBsAg prevalence.



*Figure 6: World Distribution of Chronic Hepatitis B Infection Demonstrated by HBsAg Prevalence (Hou et al., 2005).*

Approximately 45% of the world's population lives in areas where chronic HBV infection is highly endemic; 43% live in areas that are intermediately endemic; and 12% live in areas of low endemicity. The areas of high chronic endemicity include some parts of Africa (western and sub-Saharan Africa), some parts of Asia (China, Taiwan and Republic of Korea) and the Amazon Basin (Figure) (Hou et al., 2005).

Displayed in the Figure 6 are areas of intermediate prevalence which include Japan, Middle East, East and South Europe and some parts of South America. Other areas with low prevalence are North America, North and Western Europe and New Zealand (Chen et al., 2000, Custer et al., 2004). The endemicity of chronic hepatitis B is well dependent on age of individuals at time of infection and the routes of transmission. Though HBV infection in neonates is scarce in Africa due to low number of mothers who are HBeAg positive compared to Asia, there have been rising cases of HBeAg positivity from 6.4% in 1994 to 10.5% in 2005 in parturient mothers at the Korle-Bu Teaching Hospital (KBTH) in Accra (Damale et al., 2005).

Many sub-Saharan African countries are hepatitis B endemic with carrier rates ranging from 9% to 20% (Hyams et al., 1989, Kiire, 1996). The HBV prevalence rates for studies published within the period of 2003-2009 ranged from 10.5 to 22.1 %. The pooled prevalence rate across the studies published within the period was 14.7 %. For 18 studies published within the last 5 years (2010–2015), the HBV prevalence ranged from 3.6 to 16.8 % (Ali - Abdulai et al., 2016). The pooled prevalence rate across the studies published within the period was 10.2%. Such comparative information further highlights the enormity of the HBV burden in Ghana. Studies also raise serious concerns regarding the safety of blood supply in Ghana as nearly 1 in 9 blood donors may be infected with HBV with even higher proportions in replacement blood donors. Ghana has a national blood policy which requires the screening of all donated blood for HIV 1 and 2, HBV, Hepatitis C and Syphilis (WHO, 2006). Findings from studies highlight the need for stricter adherence to such policies as the risk of receiving contaminated blood, which in this is HBV remains

high. Additionally, HBV infection among pregnant women also remains high ( $\approx 1$  in 8) and which justifies the establishment of a national HBV screening program for all pregnant women in antenatal clinics throughout Ghana. Additionally, a national policy to vaccinate all pregnant women who test negative for HBV should be adopted so as to reduce the risk of mother to child transmission within the population (Ephraim et al., 2015). In a related research, the prevalence of HBV in patients diagnosed with cirrhosis was 42.9 % (Blankson et al., 2005) which to some extent, sheds light on Edington's work in 1957. Edington observed that liver cirrhosis was the common liver disease causing death at autopsy a result similar to what Blankson and his colleagues got. HBV infection was further found to be significantly associated with cirrhosis and risk of development of cirrhosis in individuals infected with HBV was eight fold higher compared with HCV by Blankson and colleagues.

### **Knowledge Level of Hepatitis B Virus and Infection**

Knowledge is formed through interaction with the surroundings where individuals themselves construct their understanding of the world through experience. Its exchange is an integral part of learning as well as helping the individual to shape his or her abilities by converting theoretical and practical skills into new knowledge. Through communication and its processes, Human knowledge is mostly acquired. Knowledge is the key to prevention and education is the key to knowledge. However, knowledge about the deadly disease in Ghana is low.

A talk with people across Kumasi has given me the impression that majority of Ghanaians have little or no knowledge or understanding of the importance of their liver condition for good health. This lack of knowledge or

awareness is not only limited to only hepatitis B but also their overall well-being in terms of health. A lot of factors impede efforts put up by established institutions like WHO and other world organizations to curb the menace of hepatitis B globally. Among these notably is the lack of knowledge and awareness among health care providers, social service professionals, adolescents, members of the public and even policy makers (WHO, 2006). Even though it is an established fact that there has been a safe and effective vaccine for hepatitis B over the past 20years, universal vaccination is still lacking in many countries (WHO, 2008).

Lack of commitment to preventive medicine and vaccines is one of the major impediments for this drawback. Most governments which are supposed to be the major financiers of public health activities have seriously not considered hepatitis B prevention as a topmost priority in health care and have opted for selective prevention strategies due to the apparent lack of knowledge about hepatitis B (Akumiah & Sarfo., 2015). Most interventions aimed at reducing HBV prevalence among high risks groups have failed because of the inability to access these groups. There is also lack of perceived risk among these high risk groups and over 30% of those with acute hepatitis B infection do not have identifiable risk factors (Mangtani, 1995).

Lack of knowledge on hepatitis B virus infection makes the condition a serious health issue which needs greater attention. Prompt early care could be sought if a patient has knowledge about the signs and symptoms. Similarly, a person's knowledge about the mode of transmission and methods of prevention would have helped people to take measures to protect themselves and others from contracting the disease.



Burnett et al. (2007) examined the knowledge on HBV and liver cancer among 256 Vietnamese Americans with low socioeconomic status. The results showed that the participants had general knowledge of HBV, but only 22% knew that HBV could spread through unprotected sex. Many did not know that liver cancer is preventable or that it is curable. Only a third of the participants knew about the vaccine that protects against HBV. An average knowledge was confirmed by Mohamed et al. (2012) where the knowledge level about HBV infection was investigated among 433 Vietnamese men in Australia. About half of the respondents knew that HBV could spread by unprotected sex. Only 32% of them knew that sharing food and drink with an infected person is not a risk factor for being infected with HBV. Knowledge about the progression and character of the disease was higher. Approximately 60% knew that long-time infection still can transmit the disease, be asymptomatic and that treatment is available. Less than half of the respondents knew that it could turn into a lifelong disease.

A study was carried out in China (Chao et al., 2010) to investigate the knowledge about HBV among 250 health professionals by handing out a questionnaire at the “China national conference on the prevention and control of viral hepatitis”. The results showed that even among highly educated health professionals the knowledge on the disease was deficient. One-third of the respondents did not know that it is common for chronic HBV infection to be asymptomatic or that it can lead to liver cancer, liver cirrhosis and premature death. The authors believe that this increases the risk of health professionals overlooking the significance of screening even those who are asymptomatic, and vaccinating those who need it.

Mohamed et al. (2012) also found that factors associated with greater knowledge about HBV are high educational level or employment in professional jobs. The study by Taylor et al. (2005) investigated knowledge and awareness of hepatitis B among randomly selected Vietnamese adults living in the United States. About 81% of the 715 adults that participated in the study had heard of hepatitis and 67% had been tested for HBV. The knowledge of the infection was generally good, with about three-quarters knowing the different ways of transmission but only 69% knew about infection through unprotected sex.

Hwang, Huang and Yi (2010) investigated knowledge about HBV and predictors of HBV vaccination among 251 Vietnamese American college students. More than half of the participants were aware that HBV could be transmitted via unprotected sex and contaminated blood; though most of the participants' thought that HBV was transmitted through food and water. Less than one third knew that Asian Americans have higher risk of being infected with HBV than other people. About 87% had heard about HBV before and they had significantly greater knowledge compared to those who had not heard about the disease. The knowledge was also greater among those who had been screened for, or vaccinated against HBV, or had family members diagnosed with HBV or liver cancer. The study also indicated that women had greater knowledge about HBV compared to men. About 43% of the participants reported being vaccinated against HBV and they had greater knowledge than those who had not been vaccinated. Older participants or participants who were sexually active and/or knew someone with HBV were less likely to have been vaccinated.

A study conducted by Boakye (2014) on Assessing Knowledge Attitude and Perception of hepatitis B among senior high students in Dunkwa-On-Offin Ghana, revealed high level of knowledge on the disease. A look at the knowledge about Hepatitis B Virus infection among the students revealed that majority of the students answered 7 out of 11 questions on knowledge correctly. This indicates a high level of knowledge among the students. It was also revealed that majority of the respondents (92%) had heard of HBV infection. Majority of the respondents (53.6%) answered correctly that HBV could not be inherited. However, Only 20% of respondents knew HBV could be sexually transmitted. Less than half of the respondents (41%) knew correctly that HBV could be transmitted during childbirth. More than half (58%) of the respondents were right that HBV cannot be transmitted by sharing food with an infected person or eating food that has been prepared by an infected person. A majority of the respondents (81.1%) were also right that people could get HBV by eating food that has been pre chewed by an infected person, and 70% knew that HBV could be transmitted by sharing a toothbrush with an infected person. About 85% of respondents knew that holding hands with an infected person could not transmit HBV. Most of them (75%) knew infected person can have signs or symptoms like jaundice, bodily weakness, right-sided abdominal pains, fever and loss of appetite. Majority of respondents (84%) knew that even asymptomatic HBV infected persons could transmit the disease.

A study by Mary (2015) on knowledge, attitude and perception of hepatitis B among health care workers in Suntreso Government hospital

revealed generally good knowledge about the condition as most of the respondents (90%) answering correctly the questions related to knowledge.

### **Attitude towards Hepatitis B Prevention**

The term attitude comes from the latin words apto (aptitude or fitness) and acto (postures of the body), both of which have their origin in the Sanskrit root ag, meaning to do or to act. Atkinson et al. (2003) defined attitude as the favorable or unfavorable reaction to objects, people, situations or other aspects of the world. Other social psychologists considered attitudes to include Factors such as cognition, affection and behavior (Kruglanski et al., 2007). They further explained the cognition aspect of a person to mean a person's knowledge of something, the affective component represents an individual's feelings and evaluations that influence the standpoint for or against something and the behavioral aspect to be, the way people act towards a situation or a person and the motivation to make changes. Attitudes as suggested by psychologist are formed through experiences in lifetime and are usually determined by beliefs and the evaluation of such beliefs. Attitudes formed by individuals in society can be comprehensive as well as unspecific.

The connection between attitude and action carried into the 18<sup>th</sup> century, when attitude referred to as a physical orientation or position in relation to a frame of reference (Cacioppo & Berntson, 2004). Attitude is a persistent tendency to feel and behave in a particular way towards some object (Tessema, Gelaye & Chercos, 2014). Attitudes are complex cognitive processes which consist of three components: the emotional, informational and behavioural. The emotional component includes the person's feelings about an object.

The informational component consists of the beliefs and information the individual has about the object. The behavioural component consists of a person's tendencies to behave in a particular way towards an object. It is further stated that attitudes tend to persist unless something is done to change them. Attitudes can also fall anywhere along a continuum from very favourable to unfavourable. Attitudes can also be directed towards some object about which a person has feelings and beliefs (Cacioppo, & Berntson, 2004). Therefore, attitudes are a very personal matter, but they also depend on more general parameters such as tradition or socio-economic circumstances (Pfannhauser & Reichhart, 2003).

Attitude includes three components: an affect (a feeling), cognition (a thought or belief), and behaviour (an action) according to (Tesser & Shaffer, 2000). An attitude helps us define how we see situations, as well as define how we behave toward the situation or object. Attitudes may simply be an enduring evaluation of a person or object. Attitudes also provide us with internal cognitions or beliefs and thoughts about people and objects. Attitudes cause us to behave in a particular way toward an object or person. Although the feeling and belief components of attitudes are internal to a person, we can view a person's attitude from his or her resulting behavior.

A study conducted by Angelillo et al. (2001) revealed that positive attitude toward food borne disease control and preventive measures were reported by the great majority of food handlers. The study concluded that the more educated food vendors who had attended courses concerning food preparation were more likely to exhibit positive attitude as compared to their less educated ones. Atkinson et al. (2003) also defined attitude as the favorable

or unfavorable reaction to objects, people, situations or other aspects of the world. Other social psychologists considered attitudes to include factors such as cognition, affection and behavior (Kruglanski et al., 2007). They explained further the cognition aspect of a person to mean a person's knowledge of something, the affective component represents an individual's feelings and evaluations that influence the standpoint for or against something and the behavioral aspect to be, the way people act towards a situation or a person and the motivation to make changes. As suggested by psychologist attitudes are formed through experiences in lifetime and are usually determined by beliefs and the evaluation of such beliefs. Individuals in society form attitudes that could be comprehensive as well as unspecific.

By using the strength and consistency of one's attitude, a person's behaviour could be predicted. Any intervention in this regard that is aimed at changing the behavior of an individual must first of all have enough information about his or her attitudes and then employ methods that will help change these attitudes. Attitudes of which one is aware of or that are based on one's own experience can predict behavior to a higher degree than attitudes that do not meet these criteria (Smith et al., 2003). Smith et al (2003) indicated those possible factors that could help influence the attitudes of an individual include, the nature of the sender (e.g. the nurse, doctor, health worker or professional in a counseling situation), the receiver (e.g. the patient), the message itself and the social context in which the information was communicated. Trustworthiness, expertise and interpersonal attraction are important signs that should be exhibited by the sender in order to influence a person's attitude. It is important to state that for a sender to be able to make an

impact on the attitude of a receiver factors such as sex, age, self-esteem and knowledge have an important role to play.

Knowledge does not necessarily influence a person's attitude. People may be knowledgeable about a particular risk behavior but may still go ahead to do it. Knowledge about hepatitis B is necessary but the provision of knowledge alone is not sufficient since it does not necessarily lead to the behavior change. Attitudes, values and beliefs (including perceptions about personal vulnerability to infection) as well as cultural norms and the influence of family, peers and the media are all important determinants of whether or not appropriate behavior is adopted by adolescents (Emmons et al., 1986). Another important motivation for a behavior change among adolescents or anybody at risk of a health risk is the feeling of compassion for those already affected. This is backed by the fact that stigmatization of disease is often a sign of denial of potential personal risk (Parker & Aggleton, 2003).

Studies conducted by Johnson et al. (1999), which investigated adolescents attitudes towards their risks of (STDs) supported the assertion that adolescent's assessment of their risk may not be appropriate relative to the true risk. In another study conducted by Samet et al. (1997) concerning the acquisition of (HIV), it was confirmed that, adolescents may continue to engage in behaviors that increased their risk of disease acquisition despite knowledge of the risk. Additionally, some adolescents might even demonstrate knowledge of the disease prevention strategies but still feel that the risk of contracting the disease is inevitable. Samet et al. (1997) has suggested that adolescents who are more knowledgeable about a risk of a disease may be less likely to take action against it in the form of screening or prevention.

### **Practices of Students towards HBV Infection**

The process of putting an intended behavior into action is the definition of Social psychologist. Practice may be executed consciously or unconsciously which may lead to positive or negative outcomes. Individuals in society do different things for reasons best known to them. Some of the practices people engage in and for that matter adolescents are due to individual preference, peer influence, societal pressure or cultural beliefs, norm systems or for the sake of fun. In the case of adolescents, where the struggle for self-identity and group acceptance is paramount, most of the practices they engage in are peer-induced.

Another prominent fact in determining adolescent practices is cultural endorsement. In a society where tattooing and piercing of ears and eyes is fashionable, adolescents are highly motivated to do so because they will not receive criticisms from society. Societies where premarital sex is not punishable, adolescents are likely to engage in sexual intercourse since it is at this stage they begin to explore the functions of their body parts. This does not only expose them to sexually transmitted diseases like HB, HIV, syphilis and gonorrhea, but also Adolescent pregnancies and illegal abortions which are now albatross around the necks of many developing countries in Sub-Saharan Africa. Previous literature on practices adolescents engage in that expose them to HBV infection looked similar but divergent across geographical boundaries. Adolescents the world over engage in a lot of practices that predispose them to several health hazards. This has led to their classification among people at higher risk of contracting sexually transmitted diseases such as HIV/AIDS, gonorrhea, syphilis, hepatitis, etc.



Risk-taking has been identified by psychologist as one of the trademarks of adolescents. The psychological literature on risk-taking suggests that males are greater risk-takers than females, and that adolescents tend to be greater risk-takers than adults (Arnett, 1994). Risky behaviors or practices include actions involving potentially negative consequences (losses), which are offset by perceived positive consequences (gains) (Jessor, 1998). Despite these facts, adolescents usually try to cover up the perceived negative consequences of these behaviors and concentrate on the so-called positive ones such as pleasure, peer acceptance and satisfaction of needs (Moore & Gullone, 1996). Few studies seem to justify the behaviors of adolescents although they are well aware of the preceding consequences.

Jessor and Jessor (1997) argued that adolescents actively seek out risks in order to take control of their lives, deal with anxiety, frustration, inadequacy and failure; gain admission to peer groups. Carroll et al. (2002) and Martel and Anderson (2002) in a cross-sectional study discovered that adolescents and young adults are increasingly acquiring body piercing in recent times. Piercing of different body parts has globally become a fashion among a lot of adolescents in various cultures for centuries (Miler, 1997). Milner and Eichold (2001) considered body piercing as a mainstream activity for adolescents and young adults in the western society even though most of them are aware of its health effects such as bleeding, pain, infections, and allergic reactions.

One of the infection-related concerns of body piercing being raised by medical experts is its potential to transmit HBV and HIV due to improper sterilization of piercing tools (CDC, 2002). A cross-sectional study conducted among university undergraduates revealed that 51% of the students reported

currently or previously having body piercing (Mayers et al., 2002). A clinic based survey conducted among adolescents aged 12-21 years at the Naval Medical Center in San Diego in 2000-2001 reported similar results with 27% of the participants having pierced their bodies (Carroll et al., 2002). The study further highlighted the most commonly pierced parts of the body of adolescents and young adults as navel, tongue and the cartilaginous portions of the ears and that of the uncommon sites included, eyebrow, lips, nipples and genitals. Several studies have shown an association between body piercing and hepatitis B sero-conversion transmission. Johnson et al. (1999) concluded that most of the cases of hepatitis B that have been attributed to piercing, results in fulminant hepatitis and eventually leads to death of the person.

A cross-sectional survey conducted by Forbes (2001) among 341 young students in the Southwestern public University in America found that there was a statistically significant difference between men and women with body modification including tattooing and piercing compared to their counterparts. Another cross-sectional study by Braithwaite et al. (2001) among 860 adolescents' detainees in Atlanta in the United States also recorded similar results among those with body piercing and those without. Cross-sectional survey by Carroll et al. (2002) on risk behavior and tattooing among adolescents documented that teenagers who engage in tattooing or body piercing were significantly more likely to get involved in other high risk behaviors such as drug use, unprotected sex, and suicides than non-participants.

Depending on the context, the contribution of sexual intercourse to the transmission of HBV is dicey. While in most developing countries,

unprotected sex with the opposite sex by sexually active adolescents has been found to be the major source of transmission of infectious diseases and viral diseases, their counterparts in the developed world are noted for men having sex with men or women with women. This notwithstanding, the role of heterosexual intercourse in these settings in the spread of hepatitis cannot be overemphasized. The contribution of heterosexual sex in the spread of HBV has well been documented and reported with increasing frequency as confirmed by a study conducted in the United States in 1988. The study reported that heterosexual transmission of HBV infection accounted for all reported cases of hepatitis B in the United States (Alter et al., 1990).

Additionally, the risk of contracting any viral infections by blood transfusion of screened blood largely depends on the use of donated blood during the window period. Where the antibodies were not detectable easily either because their production has not yet started or antibody levels are so low that the test system could not detect them. In 2002, an epidemic erupted in the West Nile where HBV was detected for the first time after a successful screening and transplanting exercise (CDC, 2002). A similar study conducted in Kumasi, Ghana to assess the risk of hepatitis B virus infection by transfusion and was revealed that recipients of screened blood less than 10 years of age had 1:11 ratio chance of contracting HBV even after screening (Allain et al., 2003). This was attributed to the underestimated risks of infection as well as the poorly conducted manner in which screening test was done.

There is the need to intensify the education on adolescents to enable them take up this challenge into their hands and strive hard to protect and

improve upon their health as public health is fast becoming an individual's responsibility rather than a societal one. Studies have shown that adolescents are not making enough efforts to prevent diseases despite having knowledge of the disease, ways of avoiding the disease and the risk of their possibility of contracting the disease. This is usually due to the fact that adolescents underestimate the risk of getting the disease. Even though, studies conducted in other parts of the world gave divergent results, there is no available literature on efforts made by adolescents to prevent themselves from contracting the HBV in Ghana. Dobson et al. (1995) in a study on modes of HBV preventions have suggested that due to the difficulties involved in getting teenagers to enter the clinics for preventive health measures, school-based HBV vaccination programs should be resorted to because of their effectiveness proven so far. The above practices engaged in by adolescents mostly expose them to a lot of infectious diseases which hepatitis is not an exception.

### **Theories of Hepatitis B Infection**

To be able to either explain or predict behavioural change among individuals, several theories and models have been put forward. By either the introduction of an intervention or the absence of an intervention, Most of these theories and models tend to use internal and external factors to explain or predict how an individual's behaviour is influenced (Polis & Upenieks, 2003). The theories and models reviewed in the present study consider the most frequently used theories and models of sexual behaviour from varied perspectives. The theories are basically health-related, and skewed toward the knowledge and practice of factors that empower behavioural change. The

theories reviewed include: the theory of reasoned action, the theory of planned behaviour, the social cognitive theory, the health belief model and human bio-ecological model.

### **Theory of Reasoned Action**

In 1980, The Theory of Reasoned Action (TRA) was developed by Ajzen and Fishbein. This theory was developed to show discrepancy between attitude and behaviour (Ajzen & Fishbein, 1980). The TRA is based on the premise that humans are rational and that the behaviours that are being explored are under volitional control. The theory stipulates that any specific behaviour exhibited by a human being is defined by a combination of four components: action, target, context and time. So if a person is implementing a sexual risk reduction strategy (action), he/she will use condoms with prostitutes (target) in hotels (context) every time (time).

The intent to perform an action is considered the best measure for determining the actual occurrence of a desired behaviour. Intent should be defined using the same factors for defining behaviour- action, target, context and time in order to measure it accurately and effectively. A person's intention to perform behaviour is influenced by attitude and norms. According to Fishbein, Middlestadt and Hitchcock (1994), TRA provides a standard that links individual beliefs, attitudes, intentions and behaviour.

Ajzen (1985) defined attitude as a person's positive or negative feelings towards performing a defined action. The combination of a person's beliefs regarding the outcomes of a defined behaviour and the person's assessment of possible outcomes constitute feelings. From population to population the beliefs will differ. For instance, the use of condoms in a

homosexual relationship might be seen as a sign of love and trust but the introduction of that same condom into the relationship of married heterosexual couples might be considered as an admission of unfaithfulness.

A norm is described as a person's perception of other people's opinions regarding a defined behaviour. Normative beliefs generally involve a person's attitude regarding other people's views of behaviour and the willingness of the person to conform to those views. Ajzen and Fishbein (1980) argue that normative beliefs just like attitude concern the opinions of people and the evaluation of those opinions vary among populations. Individual attitudes and subjective norms are influenced by cognitive structures (behavioral and normative beliefs). Attitudes and norms on the other hand shape a person's intention to behave in a certain manner. Ajzen and Fishbein (1980) advocated that a person's intention remains the permanent norm that the desired behaviour will occur. Generally, the model appears to support a linear process in which changes in an individual's behavioural and normative beliefs will eventually affect the individual's actual behaviour.

Different degrees of influence over a person's intention are often exerted by attitudes and norms and their principal cognitive structures. For instance, a research conducted among males in Northern Thailand observed that men's perceptions of peer norms were the best predictor of condom use (Vanlandingham, Suprasert, Grandjean & Sittitrai, 1995). Another study in the United States suggested that attitudinal beliefs exerted greater influence on the intent to use condoms by sexually active females in college (Middlestadt & Fishbein, 1990).

The TRA has been used to explore several behaviours such as smoking, drinking, exercising regularly, breast-feeding, signing up for treatment programmes, dieting, using of contraceptives and voting among others (Fishbein, Middlestadt & Hitchcock, 1994). The TRA has also been used to study populations such as commercial sex workers, women, homosexuals, and patients of STI clinics. The ability to describe the drivers of an individual’s behaviour is a major strength of the TRA. The idea of intention to behave in a particular manner may be essential to better understand adoption decision making model. The inability of TRA to consider the role of environmental and structural issues due to its individualistic approach and the linearity of the theory components constitute its limitations (Kippax & Crawford, 1993).

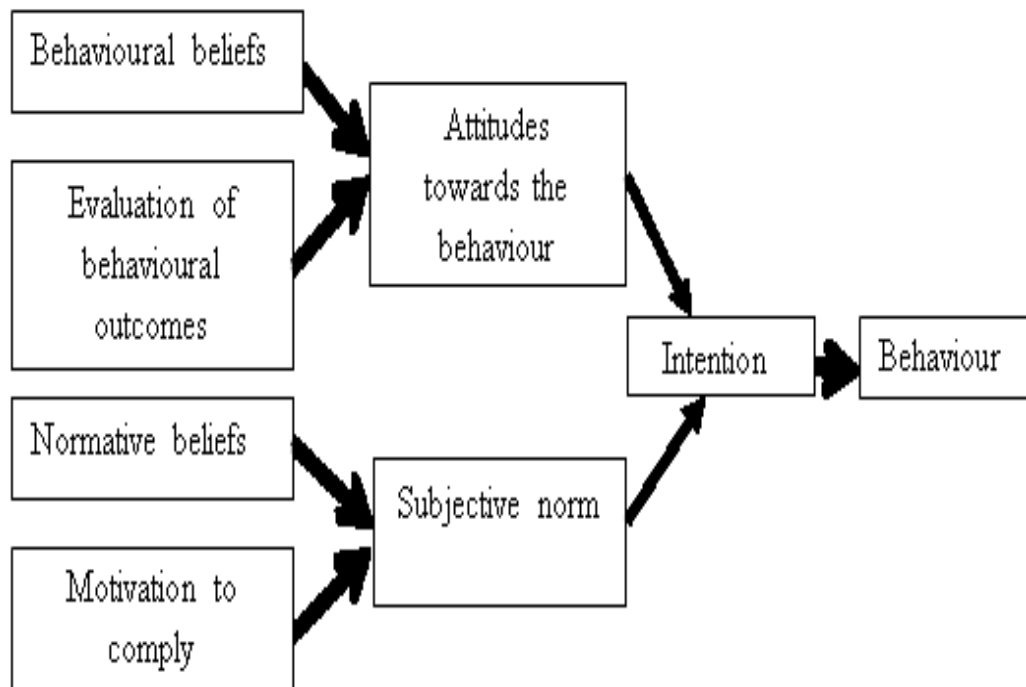


Figure 7: Theory of Reasoned Action (Ajzen & Fishbein, 1980).

## **The Social Cognitive Theory**

Developed by Albert Bandura in 1986, The Social Cognitive Theory (SCT), also known as Social Learning Theory, was to provide a framework for understanding and predicting factors which influence change in human behaviour. Bandura theorizes that for a person to take a particular course of action in SCT, individuals must possess the required skills to execute an action, believe that the action will lead to a desired outcome and that they are personally capable of performing the action (Bandura, 2001). The main tenet to the theory is the belief in one's personal capability, known as self-efficacy (Bandura, 1997).

Self-efficacy is defined as the individual's beliefs about his or her ability to perform a specific behaviour (Bandura, 1982). He reckons that self-efficacy is considered as a primary determinant of the extent to which individuals start and maintain desired behaviour changes. The degree of self-efficacy influences how much effort a person will invest when taking an action, and how long he or she will persevere in the face of difficulties or disappointing results (Polis & Upenieks, 2003). With respect to a particular action or behaviour, an individual accumulates feedback from four primary sources in order to develop self-efficacy. These four feedbacks include personal experiences of successfully performing a behaviour, vicarious experience through observing and imitating others perform a behaviour ("modelling"), verbal persuasion by others who convey to the individual that he or she is capable of performing a behaviour, and the individual's own physiological state (Bandura, 2001).



Among these four sources, the first one being successful performance of behaviour, also referred to as “mastery” experience, is considered as the most potent in raising the level of self-efficacy (Bandura, 1986). A person needs frequent and extensive practice to be proficient with a new behaviour. Ideally, practice happens with the help of extensive guidance, encouragement, and feedback. Maximum level of self-efficacy can be achieved by an individual if practice is structured so that the person approaches progressively more challenging situations followed by the gradual removal of external aids and increased opportunities for self-guided practice. Repeated failures, particularly if they occur early in the course of trying out the new behaviour, can have devastating effects on self-efficacy. The individual should be started with realistic, achievable sub goals and working gradually towards the ultimate behavioural goal to minimize this challenge. Since they constitute an important ingredient in the learning process however, there is no need to completely avoid failures and difficulties. Bandura (1997) suggests that people build strong and resilient sense of self-efficacy by overcoming difficulties through perseverance.

Learning by modeling which is the second source of self-efficacy asserts that people judge their capabilities in comparison to others whom they regard as similar to themselves (Bandura, 1990). The most common way by which humans acquire new behaviours is this source. High degree of similarity increases one’s personal relevance of the observation on his/her judgment to undertake an action. For instance, an individual who is afraid to engage in an action or behaviour benefits from seeing others in the same situation and this

may help to defeat his/her own fears and the setbacks associated with the process.

The source of feedback is verbal persuasion which provides encouragement and suggestions that can lead an individual to believe that he/she is capable of performing a desired behaviour. Verbal persuasion however, might have weaker self-efficacy expectations than personal mastery experiences because persuasion does not provide a direct experience of capacity. The impact of verbal persuasion on self-efficacy varies according to the perceived credibility of the persuaders (Bandura, 1986). The last source of feedback reckons that individuals may rely partly on their state of physiological arousal to judge their ability to perform desired behaviours. High arousal usually interferes with performance and therefore individuals are more likely to expect success when they feel relatively free of internal agitation or tension. People can strengthen their self-efficacy by acquiring skills for reducing uncomfortable physiological reactions, such as tension and agitation, and by learning to interpret these reactions as normal rather than as signs of inefficacy (Bandura, 1990).

The role played by social norms and values in the development of one's self-efficacy is ignored by Social Cognitive Theory. Social norms and values can make it impossible for someone to develop the needed skills to achieve outcomes in certain situations. Furthermore, the theory fails to recognize the effects of genetic, biological and emotional factors in an individual's life (Pervin & John, 2001).

## **Theory of Planned Behaviour**

Theory of Planned Behaviour (TPB) is an extension of the Theory of reasoned action (TRA) because it includes an additional construct known as the perceived behavioural control. (Rimer & Glanz, 2005), posit that a person's intention is a function of attitude and subjective norms. So the combination of the original concept of TRA (attitudes and subjective norms) and perceived behavioural control form the Theory of Planned Behaviour. Ajzen, the proponent of the TPB argues that intentions have three constructs: attitude, subjective norms and perceived behavioural control. The first two constructs- attitude and subjective norms- remained as defined in the TRA (Ajzen, 1991).

The third construct -Perceived behavioural control- is based on the assumption that people examine the implications of their actions before they decide to engage or not engage in a given behaviour, and that the behaviours being explored are under volitional control (Population Council, 2006). Perceived behavioural control therefore accounts for behaviour that may or may not be under the total control of the individual (Ajzen, 2002).

Ajzen (2002) refers to the idea perceived behavioural control as the appraisal of whether or not the behaviour that occurs is completely up to the actor. The two elements namely control belief and perceived powers are the divisions of the concept. The former refers to the person's perceived obstacles and opportunities for performing a specific activity and the latter refers to a person's perceived degree of control over the behaviour.

In contributing to the understanding of TPB, Ajzen and Madden (1986) argued that perceived behavioural control influences intentions and also has a

direct influence upon behaviour. The idea of self-efficacy derived from Albert Bandura’s Social Cognitive Theory (SCT) is close to the concept of perceived behavioural control. One significant difference between the TRA and TPB is the fact that the TPB recognizes that human behaviour is not 100 percent volitional hence the addition of perceived behavioural control to signify the deliberative and planned nature of behaviour but TRA on the other hand does not highlight on self-efficacy.

Even though The Theory of Planned Behaviour is an extension of the Theory of Reasoned Action it has some limitations. First of all, attitudes, subjective norms and perceived behavioural control are not limited to the determination of intention (Ajzen, 1991). Secondly, TPB is a predictive model in which an individual’s action will be based on certain benchmark such as attitudes and subjective norms.

However, individuals do not always behave as predicted by those benchmarks because it is difficult to control the behaviour of individuals in the social environment (Chang, 1998).

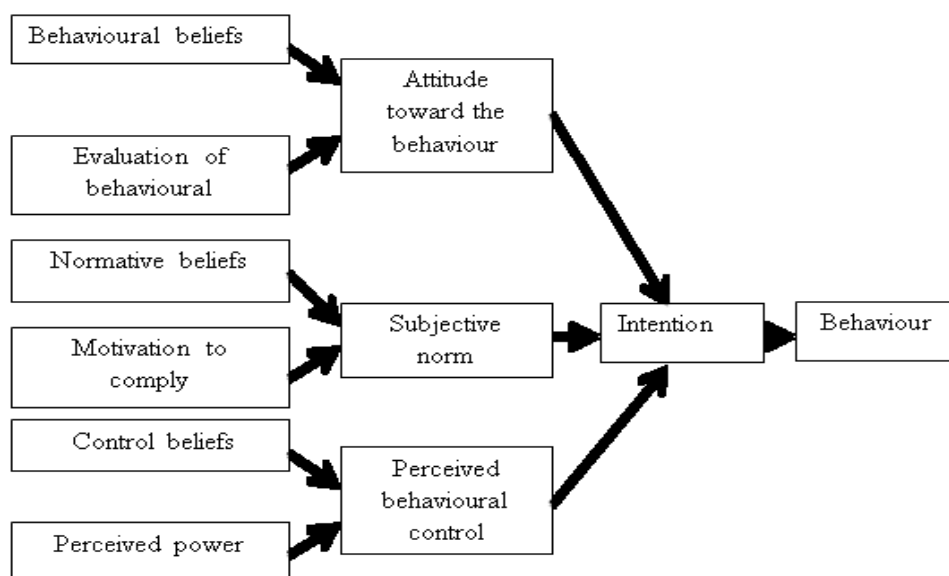


Figure 8: Theory of Planned Behavior (Rimer & Glanz, 2005)

## **Human Bio-Ecological Model**

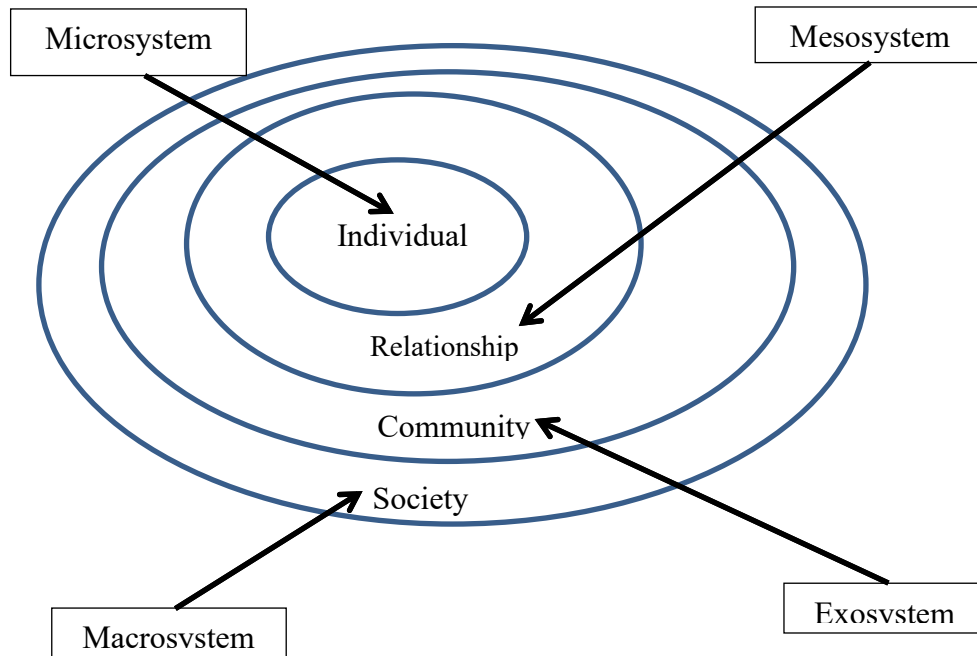
The Human Bio-Ecological Model was developed in 1979 by Bronfenbrenner to identify the environments responsible for the developments of a child. Bronfenbrenner (1979) identified four environments that influence the development of a child. These include microsystem, exosystem, macrosystem and mesosystem. The microsystem comprises the child and the array of immediate relationships and interactions around the child. The parents and other adults in the household, neighbourhood, school and friends are the other members of the environment that make up the microsystem aside the child.

The exosystem consist of the relationships between contexts in the microsystem. This means the link between families and the school system. The exosystem environment is experienced indirectly and yet it does not have direct impact on the child. This system can be empowering (as a quality child care programme could be of benefit to the whole family) and degrading (excessive stress at work could have an effect on the whole family). The third system- macrosystem consists of the customs, regulations, cultural values and the political system within which parents and children live. Bronfenbrenner (2005) posits that the macrosystem influences what, how, when and where we carry out our relations. The system also helps to hold together the threats of live (Swick & Williams, 2006). The macrosystem protects parents and their children from harm and deterioration Garbarino (1992) argues. The range of possible influences on a person is as a result of the nature of these environmental contexts of relationships. Likely to have either positive or

negative effects on the child would be a child whose macrosystem is an urban slum.

The mesosystem provides the level that is closest to the child and, therefore has staggering effect on the child. The rest of the milieus are expected to complement the primary role of parents and other members within the system. Some of the messages could be conflicting as well as compete with the general interest of the community even though the roles of these members in the system are supposed to complement one another. The mass media for instance provides an opportunity for learning and at the same time could expose children to imageries that could be confusing to parents and teachers. It beholds therefore on parents and other adults to provide a setting which will make up for some of the possible negative images.

The ability to assist in recognizing potential contributors or inhibitors to child development is one of the strengths of the Human Bio-ecological Model. Again, the model can be used in the conceptualization of programmes that are grounded in seeing measurable change in dimensions associated with the individual.



*Figure 9: Human Bio-Ecological Model (Bronfenbrenner, 1979)*

The critiques of the model argue that it fails to consider the effects of group dynamics on human development and also it does not pay adequate attention to biological factors.

### **Health Belief Model**

Health Belief Model (HBM) which is one of the first theories of health behaviour, and remains one of the widely recognized in the field was developed in the 1950s by a group of US Public Health Service social psychologists who wanted to explain why so few people were participating in programmes to prevent and detect disease (Andrew-Baum et al., 1997). The Public Health Service was reported to have sent mobile X-ray units out to neighbourhoods to offer free chest X-rays screening for tuberculosis (Gochman, 1997). The program was of limited success despite the fact that this service was offered without charge in a variety of convenient locations. The question was, “Why?” To find an answer, social psychologists examined

what was encouraging or discouraging people from participating in the programs. They theorized that people's beliefs about whether or not they were susceptible to disease, and their perceptions of the benefits of trying to avoid it, influenced their readiness to act.

It is believed generally that individuals will take action to ward off, to screen for or to control ill health conditions if they regard themselves susceptible to the condition; if they believe it to have potentially serious consequences; if they believe that a course of action available to them would be beneficial in reducing either their susceptibility to, or severity of the condition and if they believe that the anticipated barriers (cost of) taking the action are outweighed by its benefits.

According to the HBM, feeling susceptible to a disease is a motivating factor to take preventive action. For the purpose of this study, in order to determine participants' perceived susceptibility to hepatitis B viral infection, participants were asked whether they have suffered from hepatitis B viral infection before. In the case of a medically established disease, the component has been reformulated to include acceptance of diagnosis, personal estimates of susceptibility to illness as a whole, that is, whether the patient accepts the medical condition he/she had been diagnosed of; in this case, the hepatitis B viral infection.

Perceived severity, feelings concerning the seriousness of contracting an illness or of leaving the disease untreated include evaluation of both medical and clinical consequences. For example, death, pain and disability, and possible social consequences such as, effects of condition on work, family life and social relations. This implies that a patient's perception about the



severity of hepatitis B may act as a motivating factor for him or her to initiate action to prevent or fight the disease. Assessing the benefits involves determining whether engaging in the behavior will be beneficial and/or effective in preventing or curing the disease. In other words, will engaging in the behavior bring about positive outcome? In this study, the benefits were determined by asking participants what motivated them to go for vaccine or comply with the HBV infection treatment if they had been infected. At the same time, some barriers to engaging in the behavior are great enough to outweigh the benefits. They may consist of internal barriers such as belief that, taking action would cause embarrassment in the form of stigma from community members or external barriers such as lack of financial resources, transportation problems or unpleasant side effects of antiviral medication for the infection. This was also determined by asking participants the reason for not taking part in the hepatitis B vaccine.

The theory further proposes that behaviour is triggered by ‘cues of action’ which make the individual aware of the health threat. Such stimuli might be the individual’s internal symptoms or prompts from external sources such as health care providers, family members or the media. Similarly, diverse demographic (age, sex and race), socio-psychological (social class, personality, peer and reference group) and structural factors (knowledge about the disease and prior experience) are likely to play a part in shaping health behavior. But these influence behavior only indirectly by modifying the other components of the model.

From figure 10, the individual perception of HBV infection can be influenced by modifying and demographic factor like age, sex, educational

level, occupation which can lead to the likelihood of he/she taking action or not. One is more likely to take preventive measures like vaccination if he perceives himself to be susceptible to HBV infection and also the threat of the infection. Moreover, the likelihood of taking preventive measures can be influenced by the benefit for been vaccinated (perceived benefit) and the cost of the vaccine (perceived barrier).

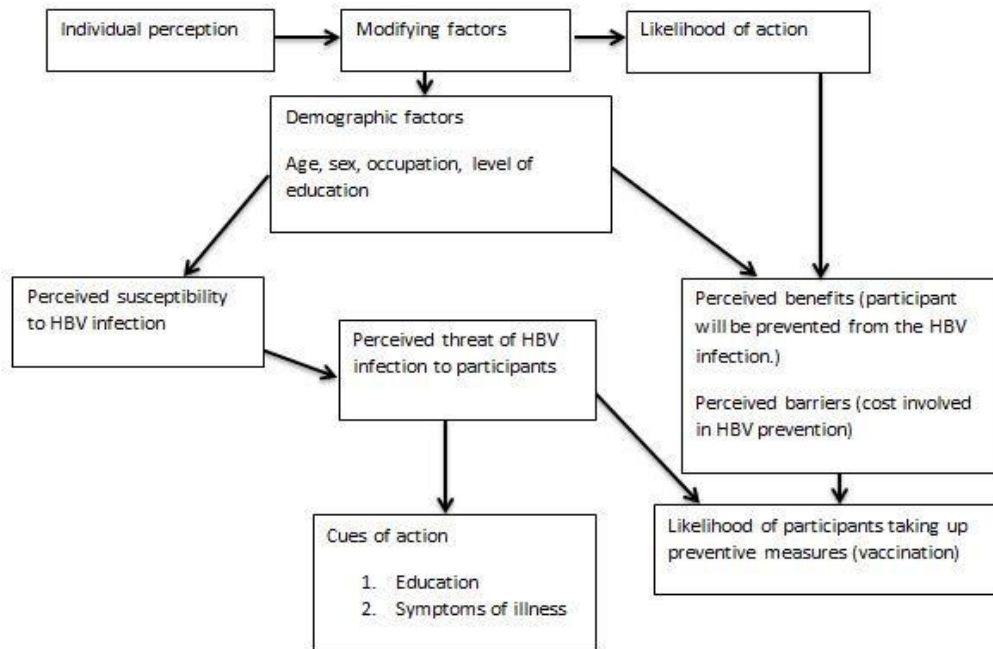


Figure 10: Health Belief Model (Rosenstock, Strecher & Berker, 1994).

### Conceptual Framework of the Study

The conceptual framework for the study is the KAP model which was first developed in the 1950s. After 1960, KAP model was used extensively in many countries to research family planning practices. The model is cost-effective and conserves resources more than other social research models because they are tightly focused and limited in scope (Eckman & Walker, 2008). This model has been widely used in the health education field in the developing world for family planning, and as a guide to understanding the mechanisms of health education for patient behavioural changes and patient

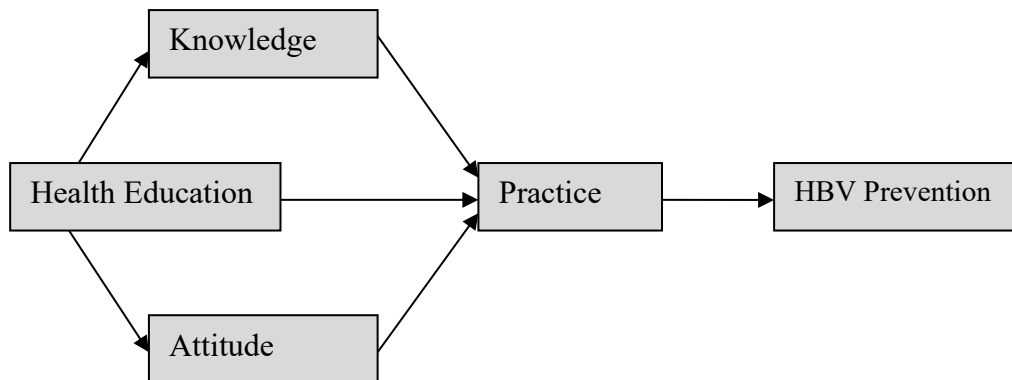
health outcomes (Jaccard, Dittus & Gorden, 1996). KAP model is now widely used for studying human behaviour when affected by a disease or problem (Hepatitis B).

For the model, 'K' stands for knowledge of the problem or disease. Knowledge is the acquisition, retention and use of information or skills (Badran, 1995). Knowledge accrues from both education and experience. Also, 'A' stands for attitude which according to Eagly and Chaiken (1993) in 'The psychology of attitude' is the psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavor. Attitude measures the feelings and beliefs about a disease. The 'P' which stands for practice or preventive behaviour to protect against the disease demonstrates the acquisition of knowledge (increased understanding of the disease) and any change in attitude caused by the removal of misconceptions about hepatitis B which translates into preventive behaviours.

The model assumes that knowledge, attitudes and practices are related and that knowledge and attitude directly influence preventive practices. Thus, a high level of knowledge can lead to a positive attitude, resulting in good practices. The model is used to measure what individuals know about a disease (hepatitis B). The KAP behaviour system framework captures both the predisposing factors of attitude and knowledge about Hepatitis B prevention, and actual behaviour. Improved attitude improves practice, and improved practice leads to improved outcomes (HBV prevention).

In the current study, the practices related to Hepatitis B as a performed behaviour are dependent on the knowledge and attitude of the teacher trainees towards Hepatitis B. Therefore, the knowledge-attitude-practice model (KAP

Model of behaviour change) forms the ideal conceptual framework of the study. The proposed relationships are illustrated in KAP Model (Figure 11)



*Figure 11: Relationship of KAP Components in Health Education Research (Wan, 2014)*

### Summary of Literature Review

Hepatitis B, caused by HBV is a serious liver disease. The disease's transmission is through human body fluids such as blood and serum. Its methods of transmission include through mother-to-baby (perinatal), the use of improper injection techniques and sexual contact.

The breakthrough understanding of hepatitis came in 1963 when Dr. Baruch Blumberg discovered an antigen that detected the presence of hepatitis B (HBV) in blood samples even though he did not set out to discover hepatitis. After further research, the antigen that caused hepatitis B was officially recognized and discovered in 1965. HBV may be transmitted horizontally and vertically and it is replicated through pregenomic RNA intermediate reverse transcription.

The stages of HBV Infection include:

1. Acute HBV Infection.
2. Chronic HBV infection.

Some common symptoms that might show up are; fever, fatigue, muscle or joint pain. Severe symptoms include jaundice and bloated or swollen stomach. The tests, or assays, for detection of hepatitis B virus infection involve serum or blood tests that detect either viral antigens (proteins) or antibodies produced by the host.

The disease is prevented by the use of safe and effective vaccine. Prevention strategies include primary prevention of new infections, secondary prevention of HBV transmission, and tertiary prevention of the pathological consequences of chronic HBV infection by anti-viral treatment.

The WHO classifies areas of the world where the prevalence of HBsAg is >8% as highly endemic, areas with prevalence of HBsAg from 2%-7% and <2% as intermediate and low endemic areas respectively. In Ghana, The HBV prevalence rates for studies published within the period of 2003-2009 ranged from 10.5 to 22.1 %.

Hepatitis B can be treated with antiviral drugs. Four medications are currently approved by the Food and Drug Administration (FDA) for treatment of chronic hepatitis B infection. These are: Interferon-alpha-2b, Lamivudine, Adefovirdipivoxil (Hepsera) and Baraclude (Entecavir).

Knowledge, attitude and practice as constructs are examined. The theory of reasoned action, the social cognitive theory, the health belief model and human bio-ecological model are also reviewed.

## **CHAPTER THREE**

### **RESEARCH METHODS**

The purpose of this study was to investigate the knowledge, attitudes and practices of Teacher Trainees in the Kumasi Metropolis on hepatitis B and its prevention. This chapter explains research design, population, sample as well as sampling procedure for the study. In addition, the research instrument that was used, data collection procedure and the procedures for the data analysis are also described.

#### **Research Design**

The study employed descriptive cross-sectional survey design. According to Gay and Airasian (2006), the descriptive survey is concerned with the conditions or relationships that exist, such as determining the nature of prevailing conditions, practices and attitudes; opinions that are held; processes that are going on; or trends that are developed. This type of study design was chosen because, considering the purpose of this study, it was the appropriate design.

In this design, the researcher draws a sample from the population of interest and generalizations are made taking into consideration responses from the subjects of the study. Osuala (2001) pointed out that descriptive surveys are practical and enable the researcher to identify present conditions as well as present needs. Osuala believes that the descriptive survey is regarded by social scientists as the best especially where a large population is involved, and it is widely used in scientific research since data gathered through descriptive

surveys represent field conditions. Best and Khan (1993), on the other hand, indicated that descriptive research concerns itself with conditions or relations that exist. Amedahe (2002) argued that in descriptive research, there is accurate description of activities and this goes beyond the mere fact-finding.

### **Population**

The population of the study is all the first and second year students of the three Colleges of Education in the Kumasi Metropolis. These students are young adults who are mostly between the age brackets of 18 to 25. According to the Vice Principals, Academic of the three colleges, the total population of the schools are 1502 students. Wesley College of Education is a mixed school located in Old Tafo sup metro and is about 100 metres from the main Suame roundabout. The college has a student population of 724 which comprises only first and second years who currently reside on campus. Thus, 445 First years, and 279 Second years. There is a Hospital where students seek medical attention. The college runs the regular programme of diploma in basic education as well as Sandwich programmes. The students pursue a three year-diploma programme spending two academic years on campus and the final year on practical teaching practice outside campus. After three years, they are posted to the basic schools where their services would be needed.

The Saint Louis College of Education is located in Mbrom in the Kumasi Metropolis. It is about 400metres away from Wesley College of Education and 500metres away from Suame Roundabout. The college is a single sex school composed of only female students. The Saint Louis College of Education runs a regular three-year diploma in education and Sandwich programmes as well. Upon completion, the female professional teachers will

be expected to teach in the various subjects in our Ghanaian basic schools. The college has a student population of 746 comprising only first and second year students. Thus, 422 level hundred and 324 level two hundred students. Finally, Cambridge College of Education is a mixed sex college of education located in South Suntreso in the Kumasi Metropolis. The College is about 400metres away from the Sofoline Flyover. The college has a student population of 32 made up of the first and second year students. Thus, 20 level hundred and 12 level two hundred students. Cambridge College of Education is a private institution managed by the owners.

### **Sampling Procedure**

A sample size of 300 was sampled from a population of 1502 involving all three colleges of education. According to Krejcie and Morgan (1970) in their table of determining sample size, they revealed that as population increases the sample size increases at a diminishing rate and remains constant at slightly more than 380 cases. Due to time and resource constraints, the researcher decided to use a sample size of 300 since that will enable the sampling of equal number of students from each school. According to Krejcie and Morgan (1970), calculating 20% of any given population is enough to make representation. In order to sample a proportional number of students from all three schools, 20% of the students in each school was calculated and the results was added to arrive at the sample size of 300. Sample size of 300 was therefore chosen since it represents about 20% of the entire population which is a fairly good representation of the entire population.

Multistage sampling technique was employed to select the sample size of 300 respondents from all three colleges of education in the metropolis.



Multistage sampling according to Ogah (2013) is the combination of sampling techniques such as simple random sampling, systematic sampling, stratified sampling and cluster in a single study. He adds that the use of multistage sampling enables researchers to put the population into levels until the sampling units are gotten. For the purpose of this study, multistage sampling was employed because the study combined purposive sampling and simple random sampling.

The researcher, based on his judgment of the problem statement and the purpose of the study purposively selected the three colleges of education located within the Kumasi Metropolis for the study. The Lottery type of simple random sampling was employed to select the individual respondents who were part of the study. 'Yes' and 'No' were written on pieces of paper and put in a bowl. The students were then asked to pick a paper each from the bowl. All those who picked yes were included in the study while those who picked no were eliminated from taking part in the study.

The background data, gender, age distribution, marital status and educational qualification of the teacher-trainees were sought. The results were discussed using frequency and percentages and presented in Table 1. Table 1 shows the results of the respondents concerning their socio-demographic characteristics. For gender, 73% (n = 218) of them were females while 27% (n = 82) were males. This result infers that the female teacher-trainees were more than the male teacher-trainees selected from the three colleges of education in Kumasi Metropolis. 55% (n = 165) of the teacher trainees were aged between 18-22 years, followed by 39% (n = 118) who were aged between 23-27 years, 2% (n = 7) were also aged between 28-32 years and 3% (n = 10) representing

33 years and above. The results obtained suggest that all the respondents are adults as defined by the constitution of Ghana and were within the range of the economically active labour force and could make informed decision.

**Table 1: Background Information of Respondents**

Variables	Sub-Scale	Frequency Percentages	
		(n=300)	
<b>Gender</b>	Male	82	27.3
	Female	218	72.7
<b>Age Distribution</b>	18-22 years	165	55.0
	23-27 years	118	39.3
	28-32 years	7	2.3
	33 years and above	10	3.4
<b>Marital Status</b>	Single	272	90.7
	Married	24	8.0
	Divorced	3	1.0
	Separated	1	0.3
<b>Educational Qualification</b>	Secondary (SSS/SHS)	287	95.7
	O. Level	3	1.0
	O. Level	7	2.3
	A. Level	3	1.0
	Others		

Out of the 300 respondents, 91% (n = 272) of them were single (Table 1) and this could be credited to that fact that the respondents are students, 8% (n = 24) of them were married while about 1% (n = 3) of them were divorced and only one student was separated representing 0.3%. Results from Table 1 show that 96% (n = 287) of the respondents hold West African Senior Secondary Certificate Examination (WASSCE) certificate while 2% (n = 7)

had A. level. On the other hand, about 1% (n = 3) of the respondents hold O level and other constituting about 1% (n = 3). This shows that all the respondents have the basic education requirement that will enable them to read and write which has a positive impact on decision making as far as health is concerned.

### **Data Collection Instrument**

The instrument employed for the data collection was a questionnaire. It was designed from a sample questionnaire used in a similar study in Alexandria, Egypt (Hanan et al., 1999) to measure the knowledge, attitude and practices of adolescents towards hepatitis B virus (*Refer to appendix A*). The researcher adapted this same instrument and made very few modifications to it (*Refer to appendix B*). The instrument was adapted because of its simplicity, ability to save time, and the possibility to make comparison as well as gather data from a group of people at a go. Questionnaire is a method of data collection which is widely used in survey research. It is very effective for securing factual information about practices and conditions of which the respondents are presumed to have knowledge. It is also used for enquiring into the opinions, views, feelings and behaviours of subjects (Ogah, 2013).

The questionnaire was divided into four major sections made up of 30 items. Section A sought to know the respondents background information such as age, sex, educational level and area of residence. Section A has 5 items under it. Section B basically talks about students' knowledge about hepatitis B and its prevention and has 11 items under it. Section C sought to find out the attitude of students of Colleges of Education in Kumasi metropolis on hepatitis B prevention. Section C also has 9 items under it. Finally, section D

sought to enquire from students what they were doing to prevent themselves from contracting the hepatitis B virus. This section has 5 items under it.

### **Pre-Testing**

The instrument was subjected to critical review to establish high validity and reliability (*Refer to Appendix E*). The researcher sought assistance from lecturers, colleague M.Phil. Students and the supervisors for useful suggestions to ensure that the instrument was valid. Also, the questionnaire was pre-tested at the Offinso College of Education. The pre-testing of the instrument was to ensure its reliability for the data collection for the main study. The pre-testing was also to detect any ambiguities in the instrument to ensure its high validity and reliability. The pre-test also helped to test the procedures for data entry and analysis, and estimate the costs and duration of the main study. Thirty students were randomly selected from Offinso College of Education for the pre-testing for first and second years.

The feedback or responses from the respondents in the pre-test were critically assessed and used to improve upon the instrument for the actual study. Thus, the suggestions given by the respondents such as “Will you kiss him/her?”, “Can you use his/her cup of water?” were found to be unclear and thus were rephrased. Findings obtained from the pre-testing enabled the researcher to re-assess and re-design the main instrument for meaningful data collection. The data from the pre-test study were screened and run on SPSS. A high reliability of the instrument was obtained with Kuder Richardson 20 (KR 20) coefficient of 0.70.

### **Data Collection Procedure**

In setting out to collect data from the respondent two stages were involved; these were pre-collection and collection stage. The pre-collection stage activities involved validation of questionnaire through consultations with researcher's supervisor and other researchers in the Department of Health Physical Education and Recreation. On the other hand, Collection stage activities involved obtaining permission to proceed with data collection, collection of data and handling of the data. Eventually, the questionnaire was validated after it had been assessed by assistant lecturers, post-graduate students of Department of Health Physical Education and Recreation and supervisor.

Before data collection begun, permission was sought from relevant individuals and authorities in the various schools (*Refer to appendix D*). The data collection process began with obtaining consent from supervisors. With the approval from the supervisors, the Department of Health Physical Education and Recreation, University of Cape Coast gave me an introductory letter (*Refer to appendix C*) to be handed to the three schools namely: Wesley College of Education, St Louis College of Education and Cambridge College of Education informing them of the purpose of the study and introducing me to them.

Following the approvals, introductions and permissions, data collection commenced. The researcher personally administered the questionnaire to the students who randomly selected in their classrooms after the purpose and procedure for collecting data had thoroughly been explained to the students. The consent of the potential respondents to participate in the study was also

sought before any questionnaire was distributed to the students (*Refer to appendix F*). The students were given enough time to complete the questionnaire after which they put them back into a box for collection by the researcher. The data collection was carried out on the last week of the academic year- from Monday July 28th to Thursday July 31<sup>st</sup>, 2017, in their classrooms during the day between the hours of 10.00 a.m. and 2.00 p.m., and over a period of three days. Thus, the whole process of data collection lasted for about 2 hours in Wesley College, 3 Hours in St' Louis College of Education and 45 minutes in Cambridge college of Education.

### **Data Processing and Analysis**

Osuala (2001) describes data analysis as the ordering and breaking down of data into constituent parts and performing of statistical calculations with the raw data to provide answers to the research questions which initiate the research.

The first step of data analysis in this study was to check for accuracy, consistency and completeness. Each questionnaire completed by the students was checked for accuracy and consistency of the responses to the items on the instrument. A template was developed and used to create a data analysis matrix on the computer, as well as code responses to the items on the instrument. After coding, the data were then entered into the computer analysis matrix developed with the computer software, Statistical Package for the Social Services (SPSS) version 23. The data entered were tested for normality rule. Since almost all the questions on the instrument were closed-ended, the numerical scale was used to measure.

The second step involved analysis of the data to answer the research questions for the study. The data was analyzed and discussed using descriptive statistics and inferential statistics. For research question one which was meant to measure the level of knowledge of students on Hepatitis B prevention was analyzed and discussed using frequency and percentages. The 11 questions on knowledge were ranked into two categories, low knowledge and high knowledge. Low knowledge refers to students who had at most 5 questions right. Those who had 6 questions and above right are those I referred to as having high knowledge.

Research question two sought to find out the attitude of teacher trainees on hepatitis B prevention. Frequency and percentages was used in analyzing and discussing the data. Students' attitude was categorized into positive attitude and negative attitude based on the direction of responses. Negative attitude refers to students who had at most 4 questions right. Those who had 5 questions and above right were those referred as having positive attitude.

The third research question also sought to find out students' practices towards the prevention of the disease. Frequency and Percentages was used in analyzing and discussing the results. The 5 questions on practices were also ranked into two categories, poor practices and good practices. Poor practices refer to students who had at most 2 questions right. Those who had 3 questions and above right are those referred to as having exhibited good practices.

Research Question four measured the relationship between students' level of knowledge about Hepatitis B and their practices on the prevention of hepatitis B. This was analyzed using Chi square test of independence to test

the statistical significance of the relationship. The Chi-Square test of independence was used to determine if there was a significant relationship between two nominal (categorical) variables. The frequency of each category for one nominal variable was compared across the categories of the second nominal variable. This test utilizes a contingency table to analyze the data. A contingency table (also known as a cross-tabulation, crosstab, or two-way table) is an arrangement in which data is classified according to two categorical variables. The categories for one variable appear in the rows, and the categories for the other variable appear in columns (Osuala, 2001).



## CHAPTER FOUR

### RESULTS AND DISCUSSION

The purpose of this study was to investigate the knowledge, attitudes and practices of Teacher Trainees in the Kumasi Metropolis on hepatitis B and its prevention and also ascertained the relationship between teacher trainees' knowledge and their practices on the prevention of hepatitis B. The present chapter deals with the presentation, interpretation and discussion of the results based on the research questions.

#### **Research Question 1: What level of Knowledge do Teacher Trainees in the Kumasi Metropolis have about Hepatitis B and its Prevention?**

This research question sought to find out the knowledge level of the respondents as far as Hepatitis B and its prevention are concerned. Table 2 shows the knowledge level of the respondents about Hepatitis B and its prevention. The result shows that many of the respondents 51% (n = 144) have high knowledge about hepatitis B and its prevention. Trainee's high knowledge could be a result of the tuition received from studying the topic 'Infectious Diseases and its Prevention' in their Integrated Science syllabus.

**Table 2: Respondents' Knowledge Level about Hepatitis B**

Knowledge Level	Frequency	Percentage
High	144	50.7
Low	140	49.3
Total	284	100.0

In addition, trainee's high knowledge exhibited could mean they listened to health programmes aired in the media/radio in the Metropolis. Knowledge about Hepatitis B can be improved through mass media programmes by broadcasting health talk intermittently within other programmes like sports, films, or music. Notwithstanding the high knowledge among many of the respondents, almost one half 49% (n = 140) of the respondents exhibited low knowledge about Hepatitis B and its prevention. The fact that 49% (n = 140) respondents have low knowledge about Hepatitis B and its prevention should not be taken lightly since their ignorance can lead to the spread of the disease. This is because trainees who have low knowledge on the mode of transmission can unknowingly transmit the virus to their colleagues.

Responses on the items that were used to assess knowledge about hepatitis B and its prevention showed that almost all the respondents 95% (n = 284) had ever heard about the existence of hepatitis B with just about 5% (n = 16) being unaware of the condition. The number, 5% (n = 16), was eliminated from the sample because they indicated they had not heard of the disease so considered ineligible to answer subsequent questions about the disease.

Table 3 depicts the knowledge of the respondents who had ever heard about hepatitis B. It was found that 60% (n = 169) of the teacher trainees knew that hepatitis B could be transmitted by sexual intercourse while 40% (n = 115) did not know that the disease could be transmitted through sexual relationships. Sixty-eight per cent of the trainees indicated that people could get HB by sharing spoons or bowls for food but 32% (n = 91) thought otherwise. More than half, 51% (n = 144) of the trainees knew that people

could get HB by eating food that has been pre-chewed by an infected person. However, 49% (n = 140), did not know that a pre-chewed food by an infected person could transmit the disease. Majority, 55% (n = 157), revealed that people could get HB by sharing a toothbrush with an infected person while, 45% (n = 127) of the trainees thought otherwise. As high as 84% (n = 237), of the respondents stated that HB could be transmitted by holding the hands of an infected person but 16% (n = 47) of the respondents thought that holding the hands of an infected person could not transmit the disease. Findings also revealed that majority, 78% (n = 222), of the trainees knew that people with HB exhibited signs and symptoms as 22% (n = 62) said HB exhibited no signs and symptoms. It was noted that majority, 57% (n = 162), of the students knew that Hepatitis B can cause cancer of the liver while, 43% (n = 122) said they did not know whether HBV infection causes liver cancer or not. As much as 72% (n = 205) of the trainees correctly answered that a Hepatitis B infected person can infect others with the disease and still feels and looks healthy but 28% (n = 79), of the respondents also answered incorrectly. 66% (n = 187) of the respondents did not know that Hepatitis B is not heritable as 34% (n = 97), indicated that HB is heritable. As shown in Table 3, 37% (n = 104), answered that HB is airborne but majority, 63% (n=180), of the respondents also answered that Hepatitis B is not an airborne disease. Moreover, 41% (n = 118) of the respondents indicated that HB could be transmitted through birth while, majority, 59% (n = 166) of the respondents thought HB cannot be transmitted through birth.

**Table 3: Respondents' Knowledge about Hepatitis B (n = 284)**

Statements	Correct	Incorrect
	n (%)	n (%)
People get HB from sexual relationships	169 (59.5)	115 (40.5)
People get HB by sharing spoons or bowls for food	193 (68.0)	91 (32.0)
People get HB by eating food that has been pre-chewed by an infected person	144 (50.7)	140 (49.3)
People get HB by sharing a toothbrush with an infected person	157 (55.3)	127 (44.7)
People get HB by holding hands with an infected Person.	237 (83.5)	47 (16.5)
People with HB have signs and symptoms	222 (78.2)	62 (21.8)
HB cause cancer	162 (57.0)	122 (43.0)
Someone can spread HB when he/she is infected with hepatitis B but he or she looks and feels healthy	205 (72.2)	79 (27.8)
People get HB from genes	97 (34.2)	187 (65.8)
People get HB from air (coughing or staying in the same room)	104 (36.6)	180 (63.4)
People get HB during birth	118 (41.0)	166 (59.0)

Findings from the study revealed that majority of the respondents 95% were aware of HBV infection. This is a great number compared to several studies (Jenkins et al., 2000; Hipgrave et al., 2003; Nguyen et al., 2010). According to the study by Hwang et al. (2010) factors such as being screened

and/or vaccinated against HBV and to have heard about HBV is correlated with a greater level of knowledge. This could explain why this study, where so many respondents had heard about HBV, shows that more than half of the participants answered correctly in the majority of the questions. The result of the current study partly agrees with similar findings by Hwang et al. (2010) who found that about 87% of first Year Bachelor of Medicine and Bachelor of Surgery (MBBS) Students at Indira Gandhi Institute of Medical Sciences, Patna had heard about Hepatitis B before and had significantly greater knowledge about the disease. Again, Taylor et al. (2005) who similarly investigated knowledge and awareness of hepatitis B among randomly selected Vietnamese adults students living in the United States found about 81% of the 715 adults that participated in the study had heard of hepatitis B. Good knowledge, attitude and practice of population are proportional to prevention against any disease and are reflective of the importance that is paid to health related issues by the society (Mohamed et al., 2012).

The current study found high knowledge among teacher trainees towards Hepatitis B prevention. This finding agrees with a similar study by Shalaby et al. (2007) in Egypt who reported adequate knowledge about Hepatitis B among apprentice Barbers in Gharbia Governorate, Egypt. The current study again corroborated a similar study by Mary et al. (2015), on knowledge, attitude and perception of hepatitis B among health care workers in Suntreso Government hospital. It was revealed that (90%) of the respondents answered correctly the questions related to knowledge. The current study is also in line with study conducted by Boakye (2014) on knowledge about the hepatitis B virus infection among students of Dunkwa-

On-Offin in Ghana. This study by Boakye (2014) revealed high knowledge about the disease among the students. The corroboration of the current study with other studies could be due to the use of similar study area (school), participants (students), and study variables for the study. The result of the study, however, contradicts similar studies by Haq et al. (2013), Haider and Haider (2008), Mohamed et al. (2012), Wu et al. (2007) and Taylor et al. (2005) who found poor knowledge regarding Hepatitis B among healthy students in Pakistan and other countries. This could be due to the use of study area (school), participants (students), and study variables that are different for the study.

Table 3 shows that 60% of the students knew that sexual relationship/unprotected sex is a possible way of HBV transmission, which is similar to the results from Taylor et al. (2005), who found that majority of the Vietnamese American men and women knew that HBV can be transmitted during sexual intercourse (71% of men, 68% of women). Findings depict 55% of the teacher-trainees knew that people could get Hepatitis B by sharing a toothbrush with an infected person. This shows that the Trainees understand the transmission of the disease since HB is transmitted by sharing toothbrush with an infected HB person. The results of the current study is similar to findings by Taylor et al. (2005) who found that majority of the Vietnamese American men and women knew that HBV can be transmitted by sharing toothbrush (67% of men, 77% of women). It was found that 72% of the trainees knew that a Hepatitis B infected person can infect others with the disease and still feels and looks healthy. Factually, even if a person infected with hepatitis B virus does not feel sick, he or she can still infect others (Adjei

e al., 2006). Majority of the trainees, 57% from the findings revealed that Hepatitis B can cause cancer of the liver. This is an indication that the Trainees do understand the seriousness of the disease.

However, in some questions the level of knowledge was shown to be lower, with less than half of the participants answering correctly. As high as 66% of the respondents did not know that Hepatitis B is not heritable. This is considered serious because the disease is not acquired through Genes. As shown in Table 3, the majority 63% of the respondents also answered incorrectly that Hepatitis B is an airborne disease. The fact that as much as 63% of the trainees answered wrongly that Hepatitis B is airborne means they do not understand the transmission in terms of airborne diseases. Another knowledge gap considered as serious is that only 39% of the respondents correctly answered that Hepatitis B could be transmitted from mother to child at birth. There is still a high incidence of acute Hepatitis B among infants due to mother to baby transmission at birth (Su et al., 2012) and at the highest risk to develop chronic Hepatitis B are infants (Chao et al., 2010; WHO, 2012). The lack of knowledge is considered to be serious since it is one of the most common ways of Hepatitis B transmission (WHO, 2012). This result suggests that most of the respondents had no knowledge on the statement.

Teachers play an important role in both school health and public health when it comes to inhibiting the spread of Hepatitis B by disseminating information on preventive measures, such as vaccination and information about the transmission of the disease (ICN, 2012). The supply of well informed and educated teachers is therefore crucial. The high knowledge of teacher trainees on Hepatitis B means that they are likely to impart the

knowledge they have on people they encounter in the course of their teaching practice. It also implies that those teacher trainees are likely to have reduced risks of hepatitis B once their knowledge influences their practice. Furthermore, the high knowledge of teacher trainees about Hepatitis B implies that they are more likely to guide themselves to take precautionary measures or adopting proper management measures of avoiding the disease by practicing safe sex and relationship. Further question was asked to find out the sources of students' knowledge on Hepatitis B. The result is presented in Table 4.

**Table 4: Source of information on hepatitis B**

Source of information	Frequency	Percentage
Radio/Media	155	54.6
School	50	17.6
Hospital	45	15.8
Family/Friends	9	3.2
Church/Mosque	8	2.8
No Response	17	6.0
<b>Total</b>	<b>284</b>	<b>100</b>

From Table 4, the radio/media was shown to be the major source of information (see Table 4). As shown in Table 4, almost 55% (n = 155) of the respondents indicated Media as the major source of information about Hepatitis B infection. This was followed by almost 18% (n = 50) of the respondents indicating school as the major source of information about Hepatitis B infection. Other sources of information indicated by respondents



involved the Hospital 16% (n = 45), Family/Friends 3% (n = 9), and Church/Mosque 2% (n = 8).

From the results above, it is evident that most of the trainees have high knowledge about Hepatitis B. However, some of the trainees have misconceptions.

**Research Question 2: What is the Attitude of Teacher Trainees in Kumasi Metropolis towards Hepatitis B and its Prevention?**

The research question sought to find out the attitude of teacher trainees in the Kumasi Metropolis towards hepatitis B and its prevention. Table 5 shows the attitude level of the respondents towards Hepatitis B and its prevention. Many of the trainees, almost 85% (n = 241), had positive attitude towards Hepatitis B and its prevention. Trainee's positive attitude towards Hepatitis B and its prevention could be the result of their high knowledge about Hepatitis B and its prevention.

Notwithstanding the positive attitude shown by many of the respondents, about 15% (n = 43) of the respondents exhibited negative attitude towards Hepatitis B and its prevention.

**Table 5: Respondents' Attitude Level towards Hepatitis B**

Attitude Level	Frequency	Percentage
Positive	241	84.9
Negative	43	15.1
Total	284	100.0

From Table 6, 57% (n = 163) of the respondents indicated they had thought of going for Hepatitis B screening whiles, 43% (n = 121) never thought of going for Hepatitis B screening. Eighty-five per cent of the

respondents agreed that healthy people need vaccination but 15% (n = 42) thought otherwise. Also, 71% (n = 201) of the trainees indicated that they would hug friends who have Hepatitis B infection as 29% (n = 83), indicated that they would not hug friends who are infected with the disease. Similarly, many of the respondents, 57% (n = 161), agreed that they would sit close to a hepatitis B patient when they visit him or her whiles, 43% (n = 123) disagreed. Moreover, 87%(n = 248) of the respondents expressed interest in getting hepatitis B vaccine for free of charge but 13% (n = 36) expressed no interest for free hepatitis B vaccination. Again, 83% (n = 236) indicated that they would ask for further screening against hepatitis B before blood transfusion whiles, 17% (n = 48) stated they would not request for any further screening before blood transfusion. Majority, 70% (n = 200) of the trainees indicated that they would kiss partners who have hepatitis B infection but 30% (n = 84) indicated otherwise. As much as 71% (n = 201) answered that they would not drink water from the cup of a Hepatitis B patient whiles, 29% (n = 83), stated that they would drink water from the cup of a hepatitis B patient. Many, 76% (n = 216), of the trainees indicated that hepatitis B patients should be isolated from the people to prevent the infection as 24% (n = 68) thought hepatitis B patients should not be isolated.

**Table 6: Respondents' Attitude towards Hepatitis B (n=284)**

<b>Statements</b>	<b>Agree (%)</b>	<b>Disagree (%)</b>
Thought of going in for HB screening	163 (57.4)	121 (42.6)
Healthy people need vaccination	242 (85.2)	42 (14.8)
I will hold my friend who has HB infection	201 (70.8)	83 (29.2)
I will sit close to HB patient when I visit him or her	161 (56.7)	123 (43.3)
I will like to get vaccinated for HB free of charge	248 (87.3)	36 (12.7)
I will kiss my partner who has Hepatitis B infection	84 (29.6)	200 (70.4)
I will ask for screening against hepatitis B before blood transfusion.	236 (83.1)	48 (16.9)
I will use a Hepatitis B patient's cup of water	83 (29.2)	201 (70.8)
Hepatitis B patient should not be isolated from the people to prevent their infection	68 (23.9)	216 (76.1)

The current study found positive attitude among teacher trainees towards Hepatitis B prevention. This finding corroborates a similar study by Singh (2011) who found that respondents had positive attitude regarding hepatitis B.

The corroboration of the current study with other studies could be due to the use of similar study area, participants, and study variables for the study. However, the result of the current study contradicts the findings of Baig et al. (2015) who found that many of the respondents had negative attitude towards

Hepatitis B. This could be due to the use of study area, participants, and study variables that are different for the study.

The study found that 57% of the trainees had thought of going for hepatitis B screening. From the findings, the teacher trainees were willing to go for Hepatitis B screening. This is considered as good attitude because screening will enable early detection of the disease which will promote prevention. Again, it was found that many of the respondents, 87%, had expressed interest in getting free hepatitis B vaccination. The most effective means to prevent HBV infection is through vaccination. Viral hepatitis is curable with effective vaccines, which is available since 1982 and has proven safe to both adults and children (WHO, 2008). The teacher trainees indicated that the vaccine be made free to enable many who cannot afford to get vaccinated to promote prevention of the disease. The hepatitis B vaccine is a safe and effective vaccine that is recommended for everyone since we are all at some risk. A similar study conducted in Egypt found high uptake of free vaccine among young student surgeons (Alam et al., 2007; Moghimi et al., 2009). Many of the respondents agreed that healthy people need vaccination as against 15% who disagreed. The fact that the majority of the trainees believe that they need HB vaccine even when healthy is an indication that they know the vaccine is safe and effective. Hence, this shows that many of the trainees understand the concept of vaccination since this will enable them prevent contraction of the disease.

However, the study found that the trainees had negative attitude towards the use of cup and other equipment of Hepatitis B patients. This finding confirmed arguments by the theory of reasoned action that a particular

behaviour leads to a particular outcome and evaluates the outcome and consequently forms an attitude towards the behaviour (Ajzen & Fishbein, 1980). The study also found that many of the trainees approve of isolation of hepatitis B patients in order to prevent infecting others. This is an indication of some level of ignorance about transmission of the disease. Isolating hepatitis B patients may turn out to promote stigmatization and may increase the burden of infection (Ul Haq et al., 2012).

The implication of this finding to the teaching profession and the public is that the positive attitude could be a motivation and expression of confidence in that the right attitudes towards the prevention of hepatitis B would be impacted in the pupils they teach and those they encounter.

### **Research Question 3: What Practices do Teacher Trainees in Kumasi Metropolis engage in to prevent them from Contracting Hepatitis B?**

The research question sought to find out the practices teacher trainees in the Kumasi Metropolis engage in to prevent themselves from contracting hepatitis B. Table 7 shows the Practice level of the respondents towards Hepatitis B and its prevention. Almost 56% (n = 160), of the respondents had good practice towards Hepatitis B. Trainee's good level of practice could be a result of their perceived risk or how vulnerable they consider themselves to getting a disease may have influenced their practices in taking certain actions.

**Table 7: Respondents' Practice Level towards Hepatitis B**

<b>Practices</b>	<b>Frequency</b>	<b>Percentage</b>
Good	160	56.3
Poor	124	43.7
Total	284	100.0

In addition, trainee's good practice exhibited could also be the result of their high knowledge about hepatitis B. In spite of the good practices among many of the respondents, almost one half 44% (n = 124) of the respondents exhibited poor practices towards Hepatitis B and its prevention. Table 8 shows the practices of the respondents towards hepatitis B. More than half, 53% (n = 151), of the respondents asked medical staff to use new syringes on them but 47% (n = 133) trainees thought otherwise. Many, 66% (n = 186), of the respondents had gotten shaved by a barber while 34% (n = 98) stated they had not been shaved by a barber. Majority, 76% (n = 216), of the respondents had also asked their Barbers to use new blades to shave them while, 24% (n = 68) of the trainees indicated that they never asked for a new blade for shaving. However, more than half, 56% (n = 159), of the respondents had not been tested for Hepatitis B but 44% (n = 125) of the trainees had been tested for HB. The majority, 57% (n = 162) had also not received the Hepatitis B Vaccine while, 43% (n = 122) had not been vaccinated against HB disease.

The current study found good practices among teacher trainees towards Hepatitis B prevention. This finding affirmed a similar finding by Al Hazmi (2015) who concluded that most of the medical students surveyed, had good practices regarding Hepatitis B. This could be due to the use of similar study area, participants, and study variables for the study. However, the findings of the current study contradicted the findings of Reang et al., (2015) who found the surveyed respondents had poor practices regarding Hepatitis B. This could also be due to the use of dissimilar study area, participants, and study variables for the study.

**Table 8: Respondents' Practices towards Hepatitis B (n = 284)**

Statements	Yes	No
	(%)	(%)
I have been tested for HB	125 (43.7)	159 (56.3)
Have you asked from medical staff to use new Syringes when required for you	151 (53.2)	133 (46.8)
I have got vaccinated against HB	122 (43.0)	162 (57.0)
Got shaved from a Barber	186 (65.5)	98 (34.5)
Asked Barber to change the blade for shaving or cutting of hair	216 (76.1)	68 (23.9)

The study found that many of the trainees had asked medical staff to use new syringes on them. Again, majority of the trainees had also made their Barbers to use new blades to shave them. The use of sharp objects such as blades and needles are some of the transmission routes through which one could be infected with the disease. The practice of trainees insisting on the use of new blades and syringes is considered a good one since it will go a long way in promoting prevention of the disease.

Notwithstanding the good practices revealed by the study, there was low percentage of trainees being vaccinated against Hepatitis B. This finding from the current study agreed with results from a study conducted by Zanetti et al. (2008) in the United State of America (USA), which showed that respondents were reluctant to be vaccinated as they fear plasma-derived vaccine which contains attenuated HBV virus. This variation could be due to the level of information received about hepatitis B and the vaccine by the respective

participants of the two studies. The above finding also supported the claim by the theory of reasoned action that the two main factors that influence behaviour change are attitudes and social norms, which lead to the development of an intention and also the eventual execution of that intention into practice. This is applicable in the current study in the sense that because there was a perceived lack of risk among teacher trainees leading to stigma and negative attitudes towards chronic carriers, it could not influence their desire to go in for Hepatitis B prevention measures. Respondents' intention negatively influenced their practice hence, the low percentage of trainees being vaccinated. This low vaccination among trainees could be due to the following; cost of vaccination not covered by National Health Insurance (NHIS) and therefore making it too expensive to undertake it or fear of the vaccine's side-effects among the trainees, limited availability of vaccination facilities in the country and lack of perceived high risk. The results of the study affirmed similar findings by researchers (Baig et al., 2015; Mesfin et al., 2013; Shalaby et al., 2007) who found low vaccine uptake by the respondents. Another worrying revelation by the study is that many of the trainees had not been tested for hepatitis B to discover status. For early detection and intervention to enable the prevention of the disease, testing is very significant and its absence becomes a setback to the prevention of the disease. This is similar to the results by Taylor et al. (2004) who reported that about two-thirds (66%) of the respondents reported they had not been tested for HBV.



**Research Question 4: What is the Relationship between Teacher Trainees' level of Knowledge and their Practices on the Prevention of Hepatitis B?**

The research question sought to find out the relationship between teacher trainees' level of knowledge and their practices on the Prevention of Hepatitis B. Table 9 contains results on the relationship between level of knowledge and practices. The results in Table 9 show a significant association  $\chi^2 (1, n = 284) = 16.305, p=.001$ , between the level of knowledge about hepatitis B and practices towards hepatitis B prevention.

**Table 9: Relationship between Level of Knowledge about Hepatitis B and Practices towards Hepatitis B prevention**

Level of Knowledge	Good		Poor		$\chi^2$	p-value
	N	%	N	%		
High	98	68.1	46	31.9	16.305	.001
Low	62	44.3	78	55.7		

The current study found significant association between the level of knowledge and practices of teacher trainees on the Prevention of Hepatitis B. This implies that high teacher-trainees' level of knowledge about Hepatitis B would significantly determine and influence their preventive practices towards Hepatitis B prevention. It was deduced that trainees with high knowledge about hepatitis B are more likely to indulge in good practices towards the prevention of the disease.

From the findings, it could be inferred that the significant association between the level of knowledge and practices in this study reaffirmed the relationship between knowledge-attitude and practice with infection control measures (Singh et al., 2010). It is also deduced that a high level of knowledge

can lead to a positive attitude, resulting in good practices. In the current study, the practices related to Hepatitis B as a performed behaviour were dependent on the knowledge and attitude of the teacher-trainees towards Hepatitis B. The reported significant association is explained by the theory of Reasoned Action. A person's intention to a specific behaviour is a function of their attitude towards that behaviour. Furthermore, the attitude toward the behaviour is determined by the person's belief that a given outcome will occur if he/she will perform the behaviour (Fisher et al., 1995). The findings affirmed the results of similar previous studies (Singh et al., 2010). The results of the current study confirmed similar findings by Ul Haq et al. (2013) who found a significant association between level of knowledge of the respondents and practices towards Hepatitis B. The results also corroborated the findings of Haq et al. (2012) who found a significant association between level of knowledge of respondents and their practices towards Hepatitis B. The corroboration of the current study with other studies could also be due to the use of similar study area, participants, and study variables for the study.

The finding implies that once teacher trainees' knowledge influence their practice, they are likely to have reduced risks of hepatitis B. More trainees are likely to go for the Hepatitis B vaccination since they have acquired the knowledge about the vaccines' efficacy. This could also lead to possible reduction in the prevalence of HB in the metropolis. Having knowledge too, could mean that as teachers to be, they are more likely to influence the behaviour of their pupils vis-à-vis HB prevention.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to investigate the knowledge, attitudes and practices of Teacher Trainees in the Kumasi Metropolis on hepatitis B and its prevention. The study also sought to ascertain the relationship between teacher trainees' knowledge and their practices on the prevention of hepatitis B. This chapter consist of three sections; namely, summary of the study, conclusions and recommendations. The summary section looks at the study from the research problem, through design of the study, sampling to key findings, the conclusions are the deductions obtained from the results of the study. The recommendations make suggestions for policy and practice.

#### **Summary**

Hepatitis B is a major public health threat globally. Despite the fact that there is a vaccine against HBV since 1982 that gives 90-100% protection against infection, there are in the world today more than 350 million people living with chronic hepatitis B. The consequence of this is approximately 600 000 HBV related deaths every year around the world, where the cause is primary liver cirrhosis or liver cancer.

There seems to be not much attention given to it by policy makers, health institutions, the general public and decision makers in spite of the long history of the disease in the country; there have not been any bold and pragmatic measures put in place to curb the disease in the country. In the light of the lukewarm attitude shown towards Hepatitis B and due to acts of

selective prevention of infectious diseases by health professionals including HB, the disease is said to be spreading fast with an estimated number of four million people as carriers. There has also been an increase in the number of deaths associated with the disease in the country.

Although hepatitis B screening and vaccination is carried out in some few health facilities in Ghana, it is not a national policy and is not incorporated into national health policies like the free counseling and testing for HIV or the mass immunization of children against measles. Studies on knowledge, attitude and practices (KAP) about teacher trainees in the Ashanti Region on viral hepatitis B are relatively poor. However, Teachers are considered to be endowed with knowledge and seen as role models in any society or community. Thus when teachers are equipped with information about Hepatitis B, they would help in the campaign against Hepatitis B infection. The knowledge level of the teacher trainees, their attitude, their practices on the prevention of Hepatitis B and relationship between teacher trainees' knowledge and their practices on the prevention of hepatitis B were ascertained.

A quantitative descriptive research, employing a cross-sectional survey design, was adopted for the study. The reference population consisted of all students (teacher trainees) in the three colleges of Education in the Kumasi Metropolis. The study population however, consisted of all first and second year students of the three Colleges of Education in the Kumasi Metropolis. The sample size was 300 (145 Wesley College, 149 from St Louis College of Education and 6 from Cambridge College of Education). Multistage sampling technique was employed to select the study subjects. A researcher generated

questionnaire was used in collecting data from the study subjects. Data collection involved two categories of activities; namely, pre-collection and collection activities.

### **Key Findings**

The findings are:

1. Hepatitis B knowledge among teacher trainees from the three Colleges of Education in the Kumasi Metropolis showed that the trainees have high knowledge on Hepatitis B prevention, though, a few of them provided incorrect responses to some of the question on HBV.
2. Teacher trainees' attitude towards Hepatitis B among the three Colleges of Education in the Kumasi Metropolis was positive, but few of the trainees also had negative attitudes towards Hepatitis B and its prevention.
3. The practices of teacher trainees of the three Colleges of Education in Kumasi Metropolis towards hepatitis B were good. However, few trainees showed poor practices towards Hepatitis B and its prevention.
4. There was a statistically significant relationship found between teacher-trainees' level of knowledge about Hepatitis B and practices towards Hepatitis B prevention.

### **Conclusions**

Based on the findings, the following conclusions have been drawn;

1. There is a high knowledge among the teacher trainees in the Kumasi Metropolis and this is likely to help the trainees to impart positively on

the children they are going to teach. The high knowledge will also enable them to put up good preventive practices.

2. There is positive attitude exhibited by the teacher trainees and this is likely to help impart upon the pupils the right attitude towards the prevention of Hepatitis B. The trainees would dispense the right attitude likely to lead to a *possible* reduction of the risk of acquiring HBV.
3. There is good practices among the teacher trainees which is likely to enable them impart upon the pupils to adapt good practices towards hepatitis B prevention. Also, their good practices can lead to possible reduction of hepatitis B prevalence.
4. There is significant relationship between teacher trainees' knowledge and their practices and this is likely to influence the behaviour of the pupils they teach. Also, the trainees are likely to go for hepatitis B vaccination since they have knowledge about the vaccine's viability.

### **Recommendations**

Based on the key findings and conclusion, the following recommendations were made;

1. Although there is high knowledge among the teacher trainees, there is the need to improve upon the knowledge level of especially those whose knowledge were low.
2. There should be rewarding scheme to reward those trainees who show high knowledge, positive attitude and good practices to spur others on.
3. Screening in the Colleges of Education must be made compulsory with education attached.

4. Although there was 56% of the teacher trainees who exhibited good practices about hepatitis B, about 44% among them also showed low practices about hepatitis B, therefore, there is the need to improve upon their way of practice towards its prevention.

#### **Suggestions for Further Study**

Since the study was conducted in only one metropolis in the country, it is important that similar studies be done in other Colleges of Education in other parts of the country.

Further studies should be conducted in other levels of education sector and other parts of the country so as to obtain broader understanding of Knowledge, Attitudes and Practices (KAP) towards Hepatitis B among students.

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**APPENDICES**

## APPENDIX A

### Original Questionnaire

The aim of this research is to assess the knowledge, attitude and practices of adolescents concerning hepatitis B. The research is purely for academic purposes. The responses that you willingly give will facilitate the completion of the study. I assure you of strict confidentiality that is why your name is not required. Please tick the most appropriate response.

#### **SECTION A: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS**

1. Sex

- Male ( )
- Female ( )

2. Age

- 10-12 ( )
- 13-15 ( )
- 16-18 ( )

3. Educational level

- Basic ( )
- Secondary ( )
- Tertiary ( )

4. Area of residence

- Rural ( )
- Urban ( )

**SECTION B: RESPONDENTS KNOWLEDGE ABOUT HEPATITIS B.**

Have you ever heard of hepatitis B?	Yes	No	Do not Know
Is hepatitis B cause by virus?	Yes	No	Do not Know
Does hepatitis B primarily affect the liver?	Yes	No	Do not Know
Can hepatitis B cause cancer?	Yes	No	Do not Know
Can hepatitis B affect any age group?	Yes	No	Do not Know
Is hepatitis B transmitted by contaminated blood?	Yes	No	Do not Know
Can hepatitis B be transmitted by un- sterilized syringes?	Yes	No	Do not Know
Can hepatitis B be transmitted by used blades of barbers?	Yes	No	Do not Know
Is hepatitis B transmitted by shared tooth brush?	Yes	No	Do not Know

Is hepatitis B transmitted by tattooing, ear and nose piercing?	Yes	No	Do not Know
Can hepatitis B be transmitted by polluted water or food?	Yes	No	Do not Know
Is there an available vaccine for hepatitis B?	Yes	No	Do not Know
Does infectious hepatitis have types?	Yes	No	Do not know
Do you know the most serious type of hepatitis?	Yes	No	Do not know
Can hepatitis B be transmitted from a mother to her baby during Pregnancy?	Yes	No	Do not Know

**SECTION C: RESPONDENTS ATTITUDES TOWARDS HEPATITIS****B.**

Do you think hepatitis B is a major health problem in Ghana?	Yes	No	Do not know
Have you ever thought of going in for hepatitis B screening?	Yes	No	Do not know
Have you yourself got vaccinated against hepatitis B?	Yes	No	Do not know
Infection with infectious hepatitis B can affect the ability of the person to visit his or her friends or for travelling?	Yes	No	Do not know
If I know my friend has hepatitis B I will be afraid of catching the infection and I will not visit him or her.	Yes	No	Do not Know
If you visit a hepatitis B patient, will you sit close to him or her?	Yes	No	Do not know
Will you kiss him or her?	Yes	No	Do not know
Can you use his or her cup of water?	Yes	No	Do not know
Should infected person with hepatitis B be isolated away from the people to prevent their infection?	Yes	No	Do not Know
Will you ask for screening against hepatitis B of blood before transfusion?	Yes	No	Do not know

Will you like to get vaccinated for hepatitis B free of charge?	Yes	No	Do not Know
If you are found positive for hepatitis B, would you like to have further investigations or treatment?	Yes	No	Do not Know

**SECTION D: PRACTICES OF RESPONDENTS ABOUT HEPATITIS**

**B.**

Have you been tested for hepatitis B?	Yes	No	Do not know
Have you yourself got vaccinated against hepatitis B?	Yes	No	Do not Know
Have you asked from medical staff to use new syringes when required for you?	Yes	No	Do not Know
Have you asked your barber to change the blade for shaving or cutting of hair?	Yes	No	Do not know
Have you got shaved from a barber?	Yes	No	Do not Know



**APPENDIX B**  
**Adapted Questionnaire**

**Questionnaire for the Teacher Trainees**

**Dear Respondent**

The aim of this survey is to examine Teacher trainees' knowledge, attitude and practices about hepatitis B infection. Your participation is voluntary to answer the following questionnaire. Your answer will be confidential. The result will be used to improve method of education and communication about health information.

Please answer the following questions and choose one answer that best expresses your opinion by placing a tick [] in the relevant box.

**SECTION A:**

**Demographic Details**

1. How old were you at your last birthday?

- a) 18-22 years []    b) 23-27 years []    c) 28-32 years []    d) 33 and above []

(2) What is your sex?

- a) Male []    b) Female []

(3) What is your "year group"?

- a) First year []    b) Second year []

(4) What is your marital status now?

- a) Single []    b) Married []    c) Divorced []    d) Separated []

(5) What is the highest level of education attained?

- a) S. H. S []    b) O-Level []    c) A-Level []

d) Others (specify) .....

**SECTION B:**

**Knowledge of Hepatitis B Virus Infection among Students**

(6) Have you heard about hepatitis B (HB) infection?

- a) Yes [ ]      b) No [ ]

If yes, indicate your source of information.....

If no state why.....

(7) Do people get HB from genes (heredity)?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(8) Do people get HB through the air (coughing or staying in the same room)?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(9) Do people get HB from sexual relationships?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(10) Do people get HB during birth?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(11) Do people get HB by sharing spoons or bowls for food?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(12) Do people get HB by eating food that has been pre-chewed by an infected person?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(13) Do people get HB by sharing a toothbrush with an infected person?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(14) Does HB have signs and symptoms?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(15) Does HB cause liver cancer?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(16) If someone is infected with hepatitis B but he or she looks and feels healthy, do you think that person can spread hepatitis B?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

**SECTION C:**

**Respondents' Attitude towards Hepatitis B.**

(17) Have you ever thought of going in for hepatitis B screening?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(18) Do you think healthy people need vaccination?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(19) If I know my friend has hepatitis B I will be afraid of catching the infection and I will not visit him or her

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(20) If you visit a hepatitis B patient, will you sit close to him or her?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(21) Will you kiss a Hepatitis B Patient?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(22) Can you use a Hepatitis B Patient's cup of water?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(23) Should infected person with hepatitis B be isolated away from the people to prevent their infection?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(24) Will you ask for screening against hepatitis B of blood before transfusion?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(25) Will you like to get vaccinated for hepatitis B free of charge?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

**SECTION D:**

**Practices of Respondents about Hepatitis B.**

(26) Have you been tested for hepatitis B?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(27) Have you yourself got vaccinated against hepatitis B?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(28) Have you asked from medical staff to use new syringes when required for you?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(29) Have you asked your barber to change the blade for shaving or cutting of hair?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

(30) Have you got shaved from a barber?

- a) Yes [ ]      b) No [ ]      c) Don't know [ ]

**Thank you for your participation!**

APPENDIX C

Introductory Letters

UNIVERSITY OF CAPE COAST  
CAPE COAST, GHANA  
COLLEGE OF EDUCATION STUDIES  
*Department of Health, Physical Education & Recreation*

TELEPHONE: 233-0206610931, 0543021384, 0268392819  
TELEX: 2552, UCC, GH.



Cables & Telegrams:  
UNIVERSITY, CAPE COAST

Ref. No. ED/MHE/14/0004/

8<sup>th</sup> April 2016

The Chairman,  
Institutional Review Board,  
University of Cape Coast,  
Cape Coast.

**INTRODUCTORY LETTER – RICHARD ARTHUR (ED/MHE/14/0006)**

The bearer of this letter is an MPhil student of the above department. In partial fulfilment of the requirements for the programme. He is conducting research titled "**KNOWLEDGE, ATTITUDE AND PRACTICES OF TEACHER TRAINEES ABOUT PREVENTION OF HEPATITIS B VIRUS INFECTION IN THE KUMASI METROPOLIS**" and would need assistance from your outfit.

We would therefore be most grateful if permission could be given to him to carry out the research.

We count on your co-operation.

Thank you.

Prof. Joseph K. Mintah  
HEAD

St. Louis College of Educ.  
  
VICE-PRINCIPAL

UNIVERSITY OF CAPE COAST  
CAPE COAST, GHANA  
COLLEGE OF EDUCATION STUDIES  
*Department of Health, Physical Education & Recreation*

TELEPHONE: 233-0206610931, 0543021384, 0268392819  
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We would therefore be most grateful if permission could be given to him to carry out the research.

We count on your co-operation.

Thank you.

Prof. Joseph K. Mintah  
HEAD

PRINCIPAL  
WESLEY COLLEGE OF EDUCATION  
KUMASI

UNIVERSITY OF CAPE COAST  
CAPE COAST, GHANA  
COLLEGE OF EDUCATION STUDIES  
*Department of Health, Physical Education & Recreation*

TELEPHONE: 233-0206610931, 0543021384, 0268392819  
TELEX: 2552, UCC, GH.



Cables & Telegrams:  
UNIVERSITY, CAPE COAST

Ref. No. ED/MHE/14/0004/

8<sup>th</sup> April 2016

The Chairman,  
Institutional Review Board,  
University of Cape Coast,  
Cape Coast.

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We would therefore be most grateful if permission could be given to him to carry out the research.

We count on your co-operation.

Thank you.

Prof. Joseph K. Mintah  
HEAD

CAMBRIDGE COLLEGE OF EDUC.  
KUMASI  
  
VICE PRINCIPAL

**APPENDIX D**  
**Permission Letters**

11<sup>th</sup> December, 2018

**TO WHOM IT MAY CONCERN**




Richard Arthur, a masters student of University of Cape Coast administered a questionnaire for a research titled “Knowledge, attitude, and practices of teacher Trainees about “Prevention of Hepatitis B virus infection in the Kumasi Metropolis” in St. Louis College of Education.

He was given the permission to carry out this exercise on the 27<sup>th</sup> July, 2016.

Thank you.

St. Louis College of Educ.  
  
VICE-PRINCIPAL



	<p><b>THE METHODIST CHURCH GHANA</b> <b>WESLEY COLLEGE OF EDUCATION</b> P. O. BOX 1927, KUMASI, ASHANTI GHANA, WEST AFRICA GENERAL LINE: +233-32202264, PRINC. TEL/FAX: +233-322028541</p>	
Our Ref: <del>2001/36</del>	Your Ref:	Date: 11 <sup>th</sup> December, 2018.
<p><b><u>TO WHOM IT MAY CONCERN.</u></b></p> <p>Mr. Richard Arthur, an MPhil Student of University of Cape Coast conducted a research titled “Knowledge, Attitude and Practices of Teacher Trainees about Prevention of Hepatitis B virus infection in the Kumasi Metropolis”.</p> <p>He was given the needed permission and assistance to administer his questionnaire successfully. The researcher, a former student of Wesley College and now a teacher at Jachie Pramso Senior High School undertook this exercise on 27<sup>th</sup> July, 2016.</p> <p>Thank you.</p> <p> CHARLOTTE ROCKSON (MRS) PRINCIPAL</p>		
<p>E-MAIL: <a href="mailto:info@wesco.edu.gh">info@wesco.edu.gh</a>/<a href="mailto:wescoksi@gmail.com">wescoksi@gmail.com</a> WEBSITE: <a href="http://www.wesco.edu.gh">www.wesco.edu.gh</a></p>		

11<sup>th</sup> December, 2018

**TO WHOM IT MAY CONCERN**

The bearer of this note, Mr. Richard Arthur, is an MPhil student of University of Cape Coast administered a questionnaire at Cambridge College of Education.

The questionnaire for a research titled “Knowledge, attitude, and practices of teacher trainees about prevention of Hepatitis B virus infection in the Kumasi Metropolis” was administered on the 27<sup>th</sup> July, 2016.

Thank you.

CAMBRIDGE COLLEGE OF EDUC.  
KUMASI  
  
VICE PRINCIPAL

**APPENDIX E**

**Reliability**

Reliability Output for Pre-test

---

KR-20	No. of items
.70	25

---

Reliability Output for Main test

---

KR-20	No. of items
.71	25

---

## APPENDIX F

### Informed Consent Form

**Title:** Knowledge, attitude and practices of teacher trainees on the prevention of Hepatitis B Virus infection in the Kumasi Metropolis.

**Introduction:** I am Richard Arthur, an MPhil (Health Education) student of the Department of Health, Physical Education and Recreation.

**Address:** University of Cape Coast

College of Education Studies

Department of Health, Physical Education and Recreation

Cape Coast

**General information about Research:** This study seeks to ascertain the knowledge, attitude and practices of teacher trainees on the prevention of Hepatitis B in the Kumasi Metropolis. Specifically, the study will examine the knowledge level of teacher trainees about hepatitis B prevention, the attitude of teacher trainees towards Hepatitis B prevention and also find out the kind of practices the students engage in order to prevent themselves from contracting the disease. The study will further probe to see whether there is any relationship between teacher trainees' knowledge and their practices on the prevention of hepatitis B.

There are no demeaning questions asked in the instrument but any question that you are still not comfortable with can be jumped. The research instrument would take about 5-10 minutes to administer. Respondents (teacher trainees) would be expected to answer questions relating to knowledge, attitude and practices on hepatitis B. Informed consent would be sought from the participants before they would be included in the study.

### **Procedures**

We kindly implore you to participate in this research project where you will be expected to fill out a survey which will be provided by the principal investigator if you agree, and will be collected by the principal investigator. Your experience gathered as a teacher trainee would contribute to enrich this study. The type of questions that are likely to be asked are: Do people get HB from genes (heredity), do people get HB from sexual relationships. Do you think healthy people need vaccination? The questions would require participants to answer by ticking either Yes or No. If there are questions you don't want to provide answers to in the survey, you may skip it and move on to the next question.

### **Possible Risks and Discomforts**

There would be no possible risks and discomfort to the participants.

### **Possible Benefits**

This study would help improve the welfare of the citizens of the country and Teacher Trainees in particular. To use the research as an alarm blower in order to create awareness on hepatitis B prevention as a national health priority which will result in Non-Governmental Organizations (NGOs) and government's commitment to increase funding for HB prevention awareness, research and other related activities. This research would also be used as a mouthpiece to lobby for HBV immunization and treatment to be included under the current list of diseases being taken care of by the National Health Insurance Scheme or incorporate HB screening and vaccination into the voluntary counseling and testing of HIV to be done concurrently.

### **Confidentiality**

The information you give in this questionnaire will be kept confidential and used later in the study analysis. The questionnaires would be kept safe and only the researcher would have access to it. You will not be named in any reports.

### **Dissemination of results**

The results of the study will be communicated to the colleges from which the data was collected through the various college Principals. The results of the study will also be communicated to the Ashanti Regional Education Directorate.

### **Compensation**

There is no compensation package either in cash or kind to be given to you as participants.

### **Voluntary Participation and Right to Leave the Research**

Your participation is voluntary and you can withdraw from this research at any point in time you feel uncomfortable with the questions being asked without any consequences.

### **Contacts for Additional Information**

You may contact the Principal or co supervisors (Dr. Thomas Hormenu and Dr. Charles Domfeh) of the study on 0244213465 and 0504595527 respectively

### **Your rights as a Participant**

If you have any questions about your rights as a research participant you can contact the Administrator at the IRB office between the hours of 8:00

