HUMAN IMMUNODEFICIENCY VIRUS (HIV), HEPATITIS B VIRUS (HBV), HEPATITIS C VIRUS (HCV) AND SYPHILIS INFECTIONS AMONG PEOPLE WITH PSYCHIATRIC DISORDERS AT THE ANKAFUL PSYCHIATRIC HOSPITAL, GHANA

OSEI TAWIAH BENEDICT (PG 2438114)

THESIS SUBMITTED TO THE DEPARTMENT OF CLINICAL MICROBIOLOGY, KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF A MASTER OF PHILOSOPHY (M.PHIL) DEGREE IN CLINICAL MICROBIOLOGY

JULY, 2016

DECLARATION

I, Benedict Osei Tawiah, declare that except for other people's investigations which have been duly acknowledged, this work is the result of my own original research, and that this dissertation, either in whole or in part has not been presented elsewhere for another degree.

BENEDICT OSEI TAWIAH …….. ……

Signature Date

DR. T. B. KWOFIE ……..…….. ……..……

Signature Date

(SUPERVISOR)

DR. T. B. KWOFIE ……..…….. ……..……

Signature Date

(HEAD OF DEPARTMENT

DEDICATION

My work is dedicated to my ever inspiring mother, Madam Felicia Aboagye-Adowaa and my lovely wife, Mrs. Elizabeth Osei for their support, encouragement and motivation throughout the study period.

ACKNOWLEDGEMENT

I would like to express my heartfelt appreciation and gratitude to the following people and institutions that helped me made this study possible.

This research wouldn't have been possible without the dedication and commitment from many individuals who helped in diverse ways. First, my supervisor Dr. T. B. Kwofie for offering valuable support and the sacrifices he made in providing educational materials, reading of my numerous drafts, travelling to my research site for assessment and supervision throughout the research work.

Second, my external supervisor Dr. Richard K.D. Ephraim from the University of Cape Coast for offering maximum support from the time of writing the proposal to the final work.

My sincere thanks go to all academic and non-academic staff of the department of clinical microbiology, KNUST.

I would like to express my gratitude to the medical director Dr. Armah Arloo, the ethics board, and the entire staff of the Ankaful psychiatric hospital for their enormous assistance and guidance throughout the study period.

My sincere thanks goes to Mr. Prince Baah Van-ess, Mrs. Anita Eyo, Richard Michael Goka and all the study participants who willingly accepted to be interviewed and tested thus making this dissertation possible.

ABSTRACT

Background: People with psychiatric disorders are at increased risk to HIV, Hepatitis B & C and Syphilis infections as compared to general population. Many risk behaviours have been identified in studies from both developed and developing countries. The psychiatric population is usually neglected in terms of prevention and control programs as compared to the general population.

Aim: This research is the first of its kind in Ghana and seeks to determine the prevalence of HIV, HBV, HCV and Syphilis infections, its related risk behaviours among people with psychiatric disorders at the Ankaful psychiatric hospital.

Methodology: This is a cross-sectional study of the Ankaful psychiatric hospital with a total of 200 in-patients and out-patients surveyed. Participants (male/female) who were included in the study were clinically stable and above 18 years old. Questionnaire was administered on socio-demographic characteristics, psychiatric disorders, knowledge, attitude and substance use/abuse risk related practices for HIV, HBV, HCV and Syphilis infections. Serologic test was done for HIV, HBV, HCV and Syphilis after interview.

Results: The results revealed that, 55% (n=110) were male whilst 45% (n=90) were female. The mean age was 35.60 and most participants were in the age group 20-39 years i.e. 64.5% (n=129) as compared to 4.5% (n=9) for the age group of less than 20 years and above 60 years respectively.

Conclusion: The overall prevalence of HIV (5.0%), HBV (9.5%), HCV (2.0%) and Syphilis (13.5%) were recorded. Multiple infections to HBV+Syphilis (0.5%), HBV+HIV (1.0%) HBV+Syphilis (0.5%) and HIV+HBV+Syphilis (0.5%) respectively.

TABLE OF CONTENTS

LIST OF TABLES

ACRONYMS

ADHD	Attention Deficit Hyperactive Disorder
AIDS	Acquired Immuned Deficiency Syndrome
ART	Antiretroviral Therapy
CDC	Centers for Disease Control and Prevention
Cp/ml	Copies per milliliter
HBV	Hepatitis B Virus
HBsAg	Hepatitis B surface Antigen
HCC	Hepatocellular Carcinoma
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
IDU	Injection Drug Use
MSM	Men Sleeping With Men
NAMI	National Alliance on Mental Health
NGO	Non-Governmental Organization
O.A.U	Organization of African Unity
OCD	Obsessive Compulsive Disorder
OPD	Out-Patient Department
PTSD	Posttraumatic Stress Disorder
STI	Sexually Transmitted Infection
UNODC	United Nations Office on Drug and Crime
WHO	World Health Organization

CHAPTER 1

1.0 INTRODUCTION

Psychiatric patients are at risk of being infected with Human immunodeficiency virus (HIV), Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Syphilis infections since they lack knowledge about contraception and may make poorer decisions regarding sexual behavior (Sikkema, 2007). Relationships between people with psychiatric disorders and HIV, HBV, HCV and Syphilis infections may exist because patients with complex and varied social and sexual interactions may experience higher needs for both types of services. Alternatively, people with psychiatric disorders may exhibit less conscious control over their sexual interactions because of feelings of worthlessness, restlessness, boredom or anxiety (Carey *et al.*, 2001).

A research conducted by the World Health Organization (WHO) on updates of the AIDS epidemic revealed that, about 33million HIV persons are chronically infected (WHO, 2007), 170 million with HCV (WHO, 2002), 350 million with HBV (WHO, 2004) and also 12 million people acquire Syphilis infections each year (WHO, 2001). Majority of the people affected are found in the developing countries. HIV, HBV, HCV and Syphilis infections are the most prevalent STIs which have similar transmission routes, mostly through unprotected sex, needle/razor sharing, blood transfusion, and offering of drugs, shelter or food in exchange for sex which is of public health concern.

A research conducted by the WHO in 2001 to determine the prevalence and incidences of some selected curable sexually transmitted infections found out that, about 450 million people suffered from psychiatric or behavioural disorders, making it the fourth (4th) leading cause of disability in the world. Due to neuropsychiatric disorders, the WHO estimated an increase between 10.5% to 14.7% from 1990 to 2020 and also ranked major depression second after ischemic heart disease which is anticipated to be higher in developing countries.

Over the past two decades, a lot of articles have reported increased rate of STIs including HIV and AIDS, Hepatitis B and C virus, and Syphilis infection among people with psychiatric disorders (Hughes *et al*., 2015). Comparable estimate of HIV infections in the overall US adult's non-psychiatric and the psychiatric population is approximately 0.3% to 0.4% (NCHS, 2009). Relative to the general population, research has shown that women with psychiatric disorders appear to be at higher risk (estimated infection rate of 5% vs. 0.17%) for sexually transmitted infections (Marks, Senterfitt & Janssen, 2005)

Published studies has shown that, people with psychiatric disorders appears to be at increased risk of HIV, HBV, HCV and Syphilis infections and these people may indulged in risky sexual practices such as having multiple sexual partners, inconsistent condom use, same sex sexual activity and sex in exchange for money or drugs (Sikkema, 2007).These risk factors coupled with poverty and neglect among people with severe mental illness raises the concern that this population is at risk HIV, HBV, HCV and Syphilis infections. In 2001, one hundred and eighty heads of states and government representatives declared commitment on HIV and AIDS acknowledging that, the epidemic constitutes a Global emergency and one of the most formidable challenges to human life and dignity in the first ever special session of the United Nations General assembly. In addressing this emergency, which sub-Sahara Africa is the worst affected region in the world (Fitzpatrick *et al.*, 2004), there needs to be an urgent analysis of the situation in all spheres of the human population especially the most at risk groups which includes people with psychiatric disorders.

A research conducted by World Health Organization(WHO) in the early 1990s validated a panel of neurological, neuropsychiatric and psychological measures across five geographical areas (Thailand, Zaire, Germany, Kenya and Brazil) with participants of varied risk behaviors and stages of HIV diseases (including seronegative participants) (Maj *et al.*,

1994) . In all sites and across risk behaviors, they found a higher rate of depressing symptoms (affective and somatic) in symptomatic HIV-positive participants than in seronegative participants (Maj *et al.*, 1994) as well as higher rate of cognitive impairment. Evidence was found in some sites that low educational status among asymptomatic HIV positive participants was associated with impaired neuropsychological performance compared to seronegative participants (Maj *et al.*, 1994) concluding the fact that there is actually a relationship between HIV, HBV, HCV and Syphilis infections and psychiatric disorders.

A case control study conducted in London found out that Black Africans were nearly three times likely to be referred for mental health assistance than the general population of patients (Malanda *et al.*, 2001) and were more likely to be suffering from STIs including HIV and AIDS at the time of referral indicating that racial lines (i.e. Black Africans) stand the chance to be the hardest hit in terms of mental illness and HIV, HBV, HCV and Syphilis infections. There are no publish data on HIV, HBV, HCV and Syphilis infections among psychiatric patients in Ghana to address risk because of the relationship between psychiatric disorders and HIV, HBV, HCV and Syphilis infections is an important research focus with implication for preventive programs.

Despite the growing epidemic in sub-Sahara Africa, almost all the research on mental health aspects of HIV, HBV HCV and Syphilis infections has been done in Europe, America and Southern Africa, much more studies have not been done in West Africa and none can be said about Ghana to effectively address the concerns. This research therefore seeks to determine the prevalence of HIV, HBV, HCV and Syphilis infections and its risk related practices among people with psychiatric disorders.

1.1 PROBLEM STATEMENT

Mentally ill patients are at risk for sexually transmitted infections since they lack knowledge about contraception methods and may make poorer decisions regarding sexual behaviors (Meade & Sikkema 2005). People with mental illness have been identified as one of the most at risk groups of contracting STIs (Fitzpatrick *et al*. 2004).

Most published studies conducted in developed countries have shown increased rates of HIV, HBV, HCV and Syphilis among people with psychiatric disorders as compared to their respective non-psychiatric population (Himelhoch *et al*., 2009; Klinkenberg *et al*., 2003; Rosenberg *et al*., 2001). Studies conducted in developing countries especially Africa was centered on the prevalence of HIV and AIDS excluding HBV, HCV and Syphilis infections. This study seeks to include HBV, HCV and Syphilis infections to identify their prevalence among psychiatric patients in Ghana.

Research has shown that people with psychiatric disorders are likely to engage in high risk behaviors such as using injection drugs, having multiple sexual partners, infrequently using condoms, engaging in same sex sexual activities, trading sex for money or drugs and engaging in sex while using psychoactive substances ((Sikkema, 2007).

Ironically, West Africa is the worst affected in terms of HIV, HBV, HCV and Syphilis infections accounting for 70% of people living with HIV and AIDS worldwide (Fitzpatrick *et al*., 2004) but cannot boast of commensurable published studies to address the menace. In the psychiatric population where it is classified as one of the most at risk groups, Africa can only boast of few published studies (Hughes *et al*., 2015).

Therefore this research seeks to determine the seroprevalence of HIV, HBV, HCV and Syphilis infections and risk behaviours among people with psychiatric disorders in Ghana so as to inform the policy formations, Ghana Mental Health Authority, non-governmental organizations (NGOs) and other key stakeholders.

1.2 JUSTIFICATION

There are few publish studies concerning prevalence of HIV, HBV, HCV and Syphilis infections and risk behaviours of people with psychiatric disorders in Africa and none can be said about Ghana. This research seeks to investigate the prevalence, high risk behaviors and knowledge regarding HIV, HBV, HCV and Syphilis infections among people with psychiatric disorders.

The study would assess the situation of HIV, HBV, HCV and Syphilis infections. The results of the study would provide information on HIV, HBV, HCV and Syphilis infections among people with psychiatric disorders in Ghana and in a way enable stakeholders to institute appropriate measures to prevent and control HIV, HBV, HCV and
Syphilis infections among people with psychiatric disorders.

1.3 AIM

The aim of this research is to determine the seroprevalence of HIV, HBV, HCV and Syphilis infections and its related risk behaviors among people with psychiatric disorders at the Ankaful psychiatric hospital.

1.3.1 SPECIFIC OBJECTIVES

Specifically this study sought:

1. To determine the seroprevalence of HIV, HBV, HCV and Syphilis infections among people with psychiatric disorders at the Ankaful psychiatric hospital.

2. To determine the risk factors that influence the acquisition and spread of HIV, HBV, HCV and Syphilis infections among people with psychiatric disorders at the Ankaful psychiatric hospital.

CHAPTER 2

2.0 LITERATURE REVIEW

2.1 BACKGROUND

Most published studies on the prevalence of HIV and AIDS, HBV, HCV and Syphilis infections among people with psychiatric disorders are from the developed countries and very few from the developing countries and none can be said about Ghana. Research has shown for the past 18 years that, several countries clearly demonstrates that people with psychiatric disorders are at high risk for HIV, HBV, HCV and Syphilis infections through both proximal and more remote exposures by virtue of injection drug use (IDU) and unprotected sex. STIs counseling and testing in the psychiatric population however, are not commensurate with demonstrated levels of infection and risk (Walkup *et al.*, 2000; Meade & Sikkema, 2005).

2.2 HIV and AIDS

The HIV epidemic has fast become and is still a menace to global health with sub-Saharan Africa being the hardest hit. AIDS, the disease caused by the Human Immunodeficiency Virus (HIV) was first recognized in the U S in 1981 when the Centers of Disease Control and Prevention (CDC), reported the unexplained occurrence of Pneumocystis carinii Pneumonia in five previously healthy homosexual men in Los Angeles and Kaposis sarcoma in previously healthy homosexual men in New York and Los Angeles (Stout *et al.*, 2012).

Most published studies have shown that, developed countries have revealed a wider prevalence rate among people with psychiatric disorders than the psychiatric patients found in developing countries. A large multicenter study conducted by Rosenberg *et al*., (2001) to determine the prevalence of HIV, hepatitis B and hepatitis C in people with psychiatric disorders found a prevalence rate varying from 17% to 5% in rural and urban areas respectively. The findings were higher than the general population (i.e. 0.3%-0.4%). Another research work by Himelhoch *et al.*, (2007) to determine the associations between

serious psychiatric disorders and HIV and AIDS among patients in the VA health system found HIV prevalence to be 1% and 0.5%, among American veterans with and without psychiatric disorders respectively. In Spain, Fernandez-Egea *et al.*, (2002) conducted a research on 332 people with acute psychiatric disorders and found out that 1.4% of the study subjects were HIV-1-positive in a research to investigate the prevalence of human immunodeficiency virus, hepatitis B and hepatitis C infections whilst Ayuso-Mateos *et al.*, (1997) recorded 5.1% of HIV prevalence among 390 people with acute psychiatric disorders in an unlinked anonymous study to determine the HIV infections in psychiatric patients.

With regards to the few studies from the developing countries on HIV infection among people with psychiatric disorders, results have shown relatively narrow ranges of infection. A study conducted by Carey *et al*., (2001) with 948 people seeking treatment for psychiatric disorders in Southern India recorded an HIV seroprevalence rate of 1.7% which was higher as compared to the 0.7% WHO estimated for the general Indian population (WHO, 2007). In a representative national multi-center study conducted by Guimarães *et al.*, (2008) reported an HIV prevalence of 0.8% in adults with psychiatric disorders (n=2,238), randomly selected from 26 psychiatric institutions throughout Brazil and was found to be higher than the estimate for the general Brazilian population (0.6%)

(Monteiro *et al.*, 2007).

2.3 HEPATITIS B AND C

Hepatitis B is the leading cause of liver cancer in the world today and frequently leads to cirrhosis and liver failure, particularly in people with early life acquisition. Although an improvement has been made in the area of vaccination, universal vaccination of children and adults has not yet been realized (Lavanchy, 2004). With the introduction of safe and effective vaccines for almost two decades, hepatitis virus kills 600,000 to one million people annually worldwide (Kao & Chen, 2002). Approximately 15-40% of people who are

infected with HBV acquire the virus early in life and usually develops into HBV related cirrhosis or Hepatocellular carcinoma (HCC) (Fattovich *et al.*, 2008).

People with psychiatric disorders from both developed and developing countries have shown to be at high risk for acquiring HBV and HCV infections (Campos *et al.*, 2008). A research by Klinkenberg *et al.*, (2003) found 32.5% prevalence of HBV in a study conducted to determine the seroprevalence of HIV, Hepatitis B and C among people who are homeless and with co-occurring psychiatric and substance use disorders. A research published by Tabibia *et al.*, (2008) to determine prevalence of Hepatitis B and hepatitis C among veterans on a psychiatric ward found 16% prevalence rate of Hepatitis B. In Brazil, De Souza *et al.*, (2004) reported 22.4% in a survey conducted to determine the prevalence of hepatitis B virus in patients with mental problems whiles Borges *et al.*, (2010) recorded 1.64% and 14.7% for people with previous exposure to HBV and those with active HBV infection in a study conducted to the determine the seroprevalence and risk factors for suicide attempts in the WHO World Mental Health survey. Carey *et al.*, (1995) found 3% active HBV infection rate in a survey conducted to determine the seoprevalence of HIV and AIDS among people with psychiatric disorders in India.

A research conducted by Nyandindi, (2011) sampled 419 IDUs and found 75.6% and 19.3% prevalence rates of hepatitis C and depression in Dar el Salam, Tanzania. This study indicates that there is actually a link between psychiatric disorders and hepatitis C.

2.4 SYPHILIS

In late 2000, the WHO estimated that about 12 million new cases of veneral syphilis each year in the next decades and more than 90% of syphilis infections are found in the developing countries. Syphilis infections among people with psychiatric disorders are an important medical problem worldwide, due to the neurotropic potential of syphilis. Syphilis is found worldwide but its incidence have decreased drastically due to the introduction of

penicillin in the 1940s (Burton and Engelkirk, 2000) which has reflected in the prevalence of syphilis (0.6%) in Ghana (HIV Sentinel report, 2012). Most researches conducted with respect to syphilis infection among people with psychiatric disorders have been done in the developed countries and less attention has been given to the developing countries where the infection is most prevalent. A study conducted by Carey *et al.*, (2007) found a 3.3% syphilis prevalence rate among 948 in patients with psychiatric disorders in Southern India. In a national multi-center study by Guimarães *et al.*, (2008) to determine the reliability and validity of questionnaire on vulnerability to sexually transmitted infections among adults with chronic mental illness found 1.2% prevalence of syphilis infections in Brazil. Even though these published studies have been done in the developing countries, none can be said about Ghana hence the need for this survey to estimate the actual seroprevalence of syphilis among people with psychiatric disorders at the Ankaful psychiatric hospital.

2.5 RISK FACTORS FOR HIV, HBV, HCV AND SYPHILIS INFECTIONS

2.5.1 Injection Drug Use/Substance Abuse:

In countries with injection drug users (IDUs), injection drug use is among the common risk factors for acquiring HIV, HBV, HCV and Syphilis infections through sharing of injection implements with infected persons and practicing sexual risk behaviours. Studies elsewhere have shown that IDU now accounts for 1 in 10 new HIV infections worldwide (McCurdy *et al.*, 2005). Risk behaviours related to substance or drug use, cover both injection and non-injection drugs. All other forms of substance abuse, be it alcohol, cannabis, heroin or inappropriate use of legal drugs can place an individual at risk because of impaired decision making and impaired ability to negotiate safe or consensual sex (Scott and Happell, 2011). or safe injecting practices. Also substance use and abuse creates other socio-economic risks such as involvement in sex work and crime with the possibility of incarceration (Lankenau

et al., 2005). Characteristics of substance use, such as frequency of use, years of drug use and types of drugs play a role in risk.

Few studies have been conducted in Africa on Injection drug users. A situational analysis conducted in Africa in 2007 by the United Nations Office on Drug and Crime (UNODC), revealed that the number of IDUs is increasing. Countries reported to use heroin increased markedly from about 10 countries in 1990 to more than 30 in 2007. In North Africa, the prevalence of IDUs were found to be 0.22%, 0.21%, 0.23%, 0.02% and 0.09% in Algeria, Egypt, Libya, Morocco and 0.3% in Tunisia (Devi *et al.*, 2009). The report shows in Western Africa the prevalence of IDUs were 23.5%, 14%, and 3.5% in Nigeria, Sierra Leone and Cape Verde respectively with HIV prevalence among IDUs reported to be 7.9% in Nigeria and 14.5% in Cape Verde. A survey conducted globally in 2004 estimated about 13.2 million (range 7.8m-18.6m) IDUs worldwide. A research conducted by Nyandindi (2011) sampled 419 IDUs and found 51.1%, 75.6% and 19.3% prevalence rates of HIV, HCV and Depression in Dar el Salam, Tanzania. The majority of IDUs (11.7m89%) are located in the developing and transitional countries, including South and South East Asia (3.3m), East Asia and Pacific (2.3m) and Eastern Europe and Central Asia (3.2m). More than 0.25m were in Russia Federation, Ukraine, China, India, Indonesia, Pakistan, Japan, Brazil, Spain, Italy, Thailand and USA (Wodak & McLeod, 2008). Injection drug use has been reported at different rates in different parts of the world. Over 80% of all HIV infections in Eastern Europe and Central Asia are related to injection drug use. In 2007, injection-drug use was the third most frequently reported risk factor for HIV infection in the United States of America, after male-to-male sexual contact and high-risk heterosexual contact (Centers for Disease Control, 2005; 2009).

2.5.2 SEXUAL RISK BEHAVIOUR

Sexual risk behaviours are having sex with a person infected and resulting in acquisition or transmission of infection. Sexual risk behaviours may include components such as sexual experience level, level of sexual activity, concurrent and lifetime number of sex partners, frequency of sexual intercourse, mode of recruitment of partners, duration of sexual unions, types of sexual activity and condom use (Sikkema, 2007). Sexual risk behaviour is mostly difficult to measure, hence these components. Types of sexual activity, is an important question because risk will differ depending on anatomical site of sex. The riskiest sexual practice is anal receptive sex and this risk is enhanced with lack of condom use or sex with a partner with higher background prevalence of infection

(Lankenau *et al.*, 2005).

2.5.3 INCARCERATION & TATTOOING

Incarceration is a risk for STI infections (Templeton, 2006). Incarceration conditions may create riskier behaviours such as anal sex without condoms and unclean injecting equipment. Patients with psychiatric disorders do have higher rates of incarceration in the

USA and may be exposed to risky behaviours whilst incarcerated (Baillargeon *et al.*, 2009). A cross-sectional study undertaken in eight Italian prisons on correlates of infections for HIV, HBV, HCV and Syphilis using a sample of 973 inmates with 30.4% being IDUs and 0.6% men sleeping with men (MSM) found a strong link between HIV, HBV, HCV and Syphilis seropositivity and incarceration. After excluding IDUs and male homosexuals, the HIV prevalence dropped from 7.5% to 2.6% and concluded that the high rates of HIV, HBV, HCV and Syphilis infections among inmates are in part attributable to the high proportion of IDUs (Babudieri *et al.*, 2005). Most prisons around the world have a greater male population and separated from female prisons with inmates denied conjugal visits. This results in frequent male to male sexual activity as established by Human Rights Watch, 2002

and Van-Ess (2013), though the actual number of instances may be much higher than reported, as noted by Shara Abraham, 2001.

Other forms of HIV, HBV, HCV and Syphilis risk include; tattooing, skin piercings and blood brotherhood rituals involving blood exchange and blood mixing (UNODC, 2007).

2.6 PSYCHIATRIC DISORDERS

Psychiatric disorders are brain based conditions that can affect the way a person thinks, feel, and the ability to relate to others. Psychiatric disorders are brain base conditions that often result in a variety of symptoms that affect daily life (NAMI).

Psychiatric disorders include depression, schizophrenia, bipolar disorder, obsessivecompulsive disorder (OCD), posttraumatic stress disorder (PTSD), anxiety, borderline personality disorder, substance use and dependence disorders and others. For the purpose of this research, it would be limited to schizophrenia, depression and bipolar disorders.

2.6.1 SCHIZOPHRENIA

Schizophrenia is a serious brain disorder that distorts the way a person thinks, acts, expresses emotions, perceives reality, and relate to others. People with schizophrenia being the most chronic and disabling of the major psychiatric disorders often have problems functioning in society, at work, at school and in relationship.

2.6.1.1 Symptoms

In general, there are three kinds;

- Positive (Things that start to happen)
- Negative (Things that stop happening)
- Cognitive (Related to processing information)

Positive symptoms: also known as psychotic symptoms. These are changes added to a person's normal behaviour. The person starts thinking or doing things they didn't think or do before, for instance delusion and hallucination.

Negative symptoms: this refers to the absence of some traits or loss of certain behaviours of an individual.

Cognitive symptoms: They may be either negative or positive symptoms.

2.6.2 BIPOLAR DISORDER

Bipolar disorder, also known as manic-depressive illness, is a brain disorder that causes unusual shifts in mood, energy, activity levels, and the ability to carry out daily task. Bipolar disorder often appears in the late teens or early adult years. At least half of all cases start before age 25 (Kessler *et al.*, 2005)

2.6.2.1 Symptoms

Manic Episode: an overly joyful or over excited state

Depressive Episode: an extremely sad or hopeless state.

Mixed State: It is a mood episode that includes symptoms of both mania and depression. A severe form of bipolar disorder is called Rapid-cycling Bipolar disorder. Rapid-cycling occurs when a person has four or more episode of major depression, mania, hypomania or mixed states, all within a year (Akiskal, 2005). A study found out that people with rapidcycling had their first episode about 4 years earlier-during the mid to late teen years-than people with bipolar disorder (Schneck *et al.*, 2008). Rapid-cycling affects more women than men (Schneck *et al.*, 2008). Illnesses that often co-exist with bipolar disorders are substance abuse and anxiety disorders. Substance abuse is very common among people with bipolar disorder, but the reasons for this link are unclear (Bizzarri *et al.*, 2007). Substance abuse can prolong bipolar symptoms, and the behavioural problems associated with mania can lead to drinking alcohol excessively.

Anxiety disorders, such as post-traumatic stress disorder (PTSD) and social phobia also can co-occur with bipolar disorders (Mueser *et al.*, 1998; Strakowski *et al.*, 1998; Krishnan, 2005). Bipolar disorder can co-occur with attention deficit hyperactivity disorder (ADHD), which has symptoms that overlap with bipolar disorder, such as restlessness and being easily distracted. However, the symptoms of ADHD are persistent, whereas those of bipolar disorder are episodic. In addition people with bipolar disorder are at higher risk for thyroid disease; migraine headaches, heart disease, diabetes, obesity, and other physical illnesses (Krishnan, 2005).

2.6.3 DEPRESSION

Depression is a mental disorder that is mostly characterized with depressed moods.

Depression can be chronic, recurrent or may lead to impairments in a person's ability in taking care of everyday responsibilities. The worst aspect of depression is that it can lead to suicide. About one million lives are lost every year due to suicide, which is equal to 3000 suicide deaths every day. For any person who commits suicide, 20 or more may attempt to end his or her life (Mishara & Gbaden, 2002).

A research work conducted in 17 countries by the World Mental Health revealed that, 1 in 20 people were recorded for having an episode of depression in the subsequent year and also estimated that, about 350 million people suffer from depression in the world. Depressions mostly start at a younger age; reducing peoples functioning and are mostly recurring. Depression is the leading cause of disability worldwide in terms of total years lost due to disability hence the call by the World Health Organization and its member states to take action in this direction (WHO, 2011). While depression is the leading cause of disability for both males and females, the burden of depression is 50% higher for females than males (Mathers *et al.*, 2008). Depression is the leading cause of disease burden for women in both high income and low-middle income countries (Mishara *et al.*, 2002). Rahman *et al.*, (2008)

suggested in a research ‘‘The neglected ‘m’ in MCH programmes-why mental health of mothers is important for child nutrition’’ that maternal depression may be a risk for poor growth in young children in developing countries.

2.6.3.1 Symptoms

Symptoms of depression can be grouped under four subtopics namely; feelings, thoughts, behaviours and physical symptoms. Examples of each are;

Feelings: restlessness, agitated, loss of interest in sex, experiencing sense of unreality, isolated and unable to relate to other people, impatient etc.

Thoughts: difficulty remembering things, hard to concentrate or make decision, have no self-confidence and having a lot of negative thoughts.

Behaviours: avoiding social gatherings or events, self-harming, finds it difficult to speak.

Physical: difficulty sleeping, sleeping much more than usual feels tired and have no energy, loss of appetite, moving very slowly, eats a lot more than usual, using more tobacco, alcohol or other drugs than usual.

2.7 CAUSES OF PSYCHIATRIC DISORDERS

There are many theories for the causation of mental illness but the factors contributing to the development of a mental disorder are still not fully understood. Currently, it is recognized that a biological vulnerability with the interaction of psychological, social and environmental influences play a significant role (Burke *et al.*, 2005; Brown, 2011).

Biological factors are anything physical that can cause adverse effects on a person’s psychiatric health. This may be due to genetics, prenatal damage, infections, and exposure to toxins, brain effects or injuries, chemical imbalances.

Psychological risks can be a person’s upbringing, emotional experiences, and relationships with others (Goodyer, 2002). Each person is unique in how they react to psychological stressors. What may break one person may have little to no effect on another.

Psychological stressors, which can trigger mental illness, are as follows: emotional, physical or sexual abuse, loss of a significant loved one, neglect and being unable to relate to others In most instances, environmental and psychological factors complement each other resulting in emotional stress, which in turn activates a psychiatric disorder. Social factors may be current life circumstances; such as unemployment, never married, or life eventssuch as migration and poverty (Mueser *et al.*, 1998; Goodyer, 2002). A person's selfesteem is a determining factor in their overall happiness and quality of life. Poor selfesteem which is too high or too low is likely to end up in aggression, violence, anxiety, and other psychiatric disorders. People who do not fit in the masses can end up being bullied and other types of emotional abuse. People who are bullied may end up being depressed, lonely and angry.

Environmental factors which may be involved include the effect of seasons or exposure to substance use (Kelly *et al.*, 2003). Environmental and psychological factors are closely related. Events that may cause the feeling of loss or damage are most likely to cause a mental disorder to develop in an individual.

Substance use, in particular, has had much written regards in its role in mental illness. It has been considered as a cause for mental illness, as a precipitate for mental illness in those predisposed, and also as a perpetuator of mental illness with a poorer prognosis for those with a dual diagnosis of mental illness and substance use (Kärner *et al.*, 2000). Correlations of psychiatric disorders and drug use which includes the use of cannabis, alcohol and caffeine.

2.8 THE LINK BETWEEN THE RISK FOR PSYCHIATRIC DISORDERS AND STIs

There is the link between the signs and symptoms of psychiatric disorders as risk factors for sexually transmitted infections theoretically. For instance, impaired judgment, poor personal relationship skills, disinhibition, sense of worthlessness may mean adverse choices in sexual

contact or lead to risk behaviours such as illicit drug use. Sequelae of psychiatric disorders such as homelessness, substance abuse, poor relationship can be markers, external recognizable indicators, of psychiatric disorders and may overlap as indicators of STI risk (Olley & Bolajoko, 2008).

This literature seeks to analyze the connection between HIV and AIDS, HBV, HCV & Syphilis infections and psychiatric disorders in terms of risk factors with already published studies across the globe.

2.8.1 Substance use/abuse/IDUs

Substance use/abuse, especially long-term abuse can cause multiple mental disorders. Alcoholism is linked to depression while abuse of amphetamines can leave a person feeling paranoid and anxious. Chronic alcohol abuse and withdrawal from alcohol can produce psychiatric symptoms, including delusions and hallucinations and have been hypothesized both to hasten the onset of schizophrenia and to mask its presence (Monteiro *et al.*, 2007).

Correlations of mental disorders with drug use include cannabis, alcohol and caffeine.

Cannabis has been found to worsen depression and lessen an individual's motivation. Interestingly substance use, abuse and dependence have been found in many published studies both developed and developing countries as a contributory risk to acquiring HIV, HBV & HCV and syphilis infections. Substance or drug use risk factor in acquiring viral infections engulfs both injecting and non-injecting drugs. Infections through injecting drugs could be as a result of sharing of any injection equipment that may be contaminated with infected blood.

All other forms of substance abuse, be it alcohol, cannabis, heroin or inappropriate use of legal drugs can place an individual at risk because of impaired decision making and impaired ability to negotiate safe or consensual sex (Carey *et al.*, 2001) or safe injecting practices.

Studies have shown that IDU now accounts for 1 in 10 new HIV infections worldwide (McCurdy *et al.*, 2005). Few published studies have been conducted in Africa on Injection drug users (IDUs). A situational analysis conducted in Africa in 2007 by the United Nations Office on Drug and Crime (UNODC), revealed that the number of IDUs are increasing. Countries reported to use increased markedly from about 10 countries in 1990 to more than 30 in 2007. It cannot be concluded that, there is low prevalence of IDUs in the Sub-Saharan Africa since much research or attention has not been focused on this part of the continent which is the most affected in terms of STIs.

To confirm that risk factors for psychiatric disorders do overlap with HIV, HBV & HCV and syphilis, we take a critical look at a research conducted by Nyandindi, (2011) in Dar es salaam, Tanzania. In a cross-sectional study with a total of 419 known IDUs, the overall prevalence of HIV, HCV infection and Depression among injection drug users was found to be 51.1%, 75.6% and 19.3% respectively. This shows that substance use, abuse and dependence which includes injection drug use is a major risk factor for psychiatric disorders and acquiring STIs.

Therefore, there needs to be a holistic approach in dealing with psychiatric disorders and HIV, HBV, HCV, and Syphilis infections. Also there should be more focus on the most at risk populations (i.e. psychiatric population) to target their activities and control the spread of these infections.

2.9 HIV, HBV, HCV & SYPHILIS INFECTIONS RATE AMONG PEOPLE WITH PSYCHIATRIC DISORDERS

Studies have shown that, people with psychiatric disorders are at increased risk of acquiring HIV, HBV, HCV and Syphilis infection as compared to the general population. Even though most of the studies have been conducted in the developed countries, the very few studies

that have been done in the developing countries were not focused on the subSaharan African countries where the STI epidemic is most prevalent (UNODC, 2007).

This literature reviews systematically the rates of HIV, HBV, HCV and Syphilis infection among people with psychiatric disorders with published studies conducted in the developed countries and the very few ones that has been done in the developing countries. Studies from the United States and Europe conducted on psychiatric patients revealed an infection rate ranging from 3% to 23% (Carey *et al.*, 1995) considerably higher than the rates estimated for the general population with respect to HIV and AIDS infection.

Hughes *et al.*, (2015) identified 373 reports and upon selection criteria had 91 articles for quality assessment and meta-analysis. 44 studies assessed HIV infections including a total of 21071 patients of the 91 published studies. The pooled prevalence of HIV was highest in Africa (19%, 95% CI 14-25) and it was 2% in Europe and 6% in the USA.

According to Hughes *et al.*, (2015), 19 studies of the 91 articles reported prevalence of hepatitis B virus, including a total of 8163 patients with psychiatric disorders. The overall prevalence of hepatitis B virus was 2.2% (95% CI 0.5-9.9) in North America and 9.7% (95% CI 0.6-15.3) in Asia. A study from Turkey reported 51% hepatitis B viral infection with 10% HBsAg positivity indicating active infection (Kulogu *et al*., 2006).

Furthermore, 28 studies of the 91 studies tested 14888 patients with psychiatric disorders for hepatitis C virus. The prevalence of hepatitis C in people with psychiatric disorders was very high in Turkey and Hughes *et al*., (2015) attributed the findings to the high prevalence in the general population. The overall prevalence from North America gave a prevalence rate of 17.4% (95% CI 13.2-22.6), which is higher than the general population, of whom roughly 1% are infected (2.7 million) (Armstrong *et al.*, 2000).

Majority of the studies conducted in Africa were done in the South and Central African countries (Collins *et al.*, 2006; Kyei *et al.*, 2009; Maling *et al.*, 2011; Mashaphu & Mkize,

2015) and only few from West Africa (Omoregie *et al.*, 2009). Furthermore these studies concentrated their research on HIV infections and excluded HBV, HCV and Syphilis among psychiatric patients as compared to other studies conducted in other continents.

These studies published outside the continent of Africa showed increased rates of HB, HCV and Syphilis infection hence the need for this study to assess the actual prevalence of HBV, HCV and Syphilis infections among psychiatric patients in Ghana at the Ankaful psychiatric hospital.

CHAPTER 3

3.0 METHODOLOGY

3.1 STUDY SITE

The research was conducted at the Ankaful psychiatric hospital, Cape-Coast. The Ankaful Psychiatric Hospital was established in 1965. It was originally meant to be a 500 bedded hospital but due to the hosting in Ghana of the Organization of Africa Unity (O.A.U) conference in May 1965, patients on rehabilitation at Adomi near Senchi in the Eastern region and Accra psychiatric Hospital were rounded up and sent into the uncompleted structures at Ankaful. This was the beginning of the Ankaful psychiatric Hospital.

Politically, the Ankaful psychiatric hospital is located in the Komenda, Edina, Eguafo, Abrem municipal Assembly, even though it still maintains links with the Cape Coast municipality. It is approximately 12.5km from Cape Coast and 6km from Elmina, occupying an estimated land area of about 1.5sq.km. It is precisely located at the village called Ankaful

where it derives its name; it shares boundaries with Ankaful Leprosy/General Hospital to the east and the Ankaful Prisons complex in the west. The hospital has eleven wards but only seven are operational mainly due to the inadequate funding. Three wards have been let out to Cape Coast Nurses and Midwifery College and one ward currently being used as a basic school due to their inability to maintain such

facilities.

A good number of the Hospital's departments are ill equipped and understaffed reminiscent of this disturbing condition is the occupational therapy unit. The general infrastructure is in a total state of disrepair; some roofing sheets have ripped off, cracks have developed in some buildings and most buildings leak badly. Beside, tools,

machinery, recreational kit for patients are not available.

3.2 DESIGN

The study is a descriptive cross-sectional hospital based study. A cross-sectional study has the advantage of giving the rate of occurrences of knowledge and attitude among the study sample at any specific point in time (Polit and Beck 2010).

3.3 STUDY POPULATION/PARTICIPATION

Participants (male and female) who met common criteria for psychiatric disorders including diagnosis of schizophrenia, bipolar disorder, depression, psychotic disorder, substance abuse and dependence disorders using a convenient sample were enrolled in the study. All participants who were recipient of in-patients or out-patients treatment were assessed. Inpatients were consecutive, (i.e. patients admitted to the Ankaful psychiatric hospital wards during the study period). Participants who visited the Out Patient Department (OPD) during the study period and were able to give informed consent were enrolled in the study population.

3.4 PRE TESTING OF THE QUESTIONNAIRE

A pilot study with ten patients (i.e. in-patients and out-patients) recruited from the ward and the out-patients departments (OPD) respectively were used to test the questionnaire. The pilot study also helped determine the length of time it took to administer the questionnaire and necessary refinements were made.

3.5 INCLUSION CRITEREA

Participants with the following features were enrolled in the study:

- ✓ Participants who were clinically stable and able to give informed consent.
- ✓ Participants who were 18 years and above.
- ✓ In-patients and out-patients.

3.6 EXCLUSION CRITEREA

Participants were excluded from the study if:

- ✓ They were not clinically stable.

3.7 ETHICAL CLEARANCE

The study protocol was subjected to ethical review and approved by the Committee on Human Research and Ethics Department of Kwame Nkrumah University of Science and Technology. Approval was also given by the medical director, Ankaful Psychiatric Hospital.

3.8 CONSENT

All patients participating in the study signed or thumb printed a consent form. The purpose of study and their willingness to participate in the study was specified in the consent form. It was made clear that, acceptance or refusal to participate in the study had no consequences on the patient and that, they were free not to participate in the study at that time. Patients

were free not to answer questions if they did not feel or think is very sensitive to them or psychologically traumatized after given informed consent. The questionnaire was given unique identifiers; alphabets and numbers were used, therefore assuring clients that information provided was confidential.

The benefits and risks of participations were stated clearly in the consent form, though risks were minimally expected in this study.

3.9 QUESTIONNAIRE ADMINISTRATION

Participants who were clinically stable and able to give informed consent answered structured questionnaires. The structured questionnaires were grouped into five sections regarding background characteristics, knowledge about STIs and vaccination, history about forced sex and sex work and substance use/abuse behaviours. The aim of the questionnaire administration was to achieve the second specific objective of the study thus to identify if people with psychiatric disorders were likely to indulge in high risk sexual practices such as using injection and non-injection drugs, having multiple sexual partners, inconsistent condom use, engaging in same sex sexual activities, sex in exchange for money or drugs and forced sex. Participants were free to pull out of the study at any point in time even after informed consent is given. Also participants enrolled to the study were free not to answer any question if they feel is too sensitive to them.

Participants histories on psychiatry diagnosis were recorded in the questionnaire forms by the psychiatric nurses before the other sections of questionnaire are administered.

3.10 SAMPLE SIZE ESTIMATION

Prevalence of Hepatitis B is the highest (i.e. 15.3%) among HIV and AIDS and Hepatitis C hence used in calculating the estimated sample size of the study. Ghanaweb health news of Sun, 28 Jul 2013. (Ghana rated high risk for Hepatitis B and C). Dr. Nii Anum Ayerh,

Vice President of the Hepatitis Society of Ghana.

The estimated sample size N is completed using the formula below

$N = z^2pq/d^2$

Where;

N = Estimated sample size

z = the standard normal deviation, which turns out to be 1.96 on using the 95% confidence level.

P = estimated prevalence q

= (1-p) = (1-0.153)

Therefore q = 0.85 d =

Allowable error (0.05)

N = (1.96) *0.153*0.85/ (0.05)

= 3.81*0.153*0.85/0.0025

= 0.499/0.0025

= 199.7

Therefore estimated sample size is 200

N = 200 estimated people with psychiatric disorders.

3.11 PROCEDURES

All individuals admitted as in-patients and out-patients to the wards and the outpatient departments (OPD) respectively of the Ankaful psychiatric hospital, Cape Coast, Ghana, during the study period were potentially eligible to participate in the study. During the study period, there were 145 in-patients in the various wards of the hospital. In-patients and out-patients were not approached directly but were first assessed by their attending psychiatrist, psychiatric nurses before they are referred to the study. Participants who were enrolled in the study were clinically stable and able to provide informed consent.

Participants received pretest counseling for HIV, HBV, HCV and Syphilis infections before blood samples were taken through venipuncture. Blood samples were analyzed at the laboratory unit of the Ankaful psychiatric hospital and the Cape Coast Teaching Hospital's laboratory respectively.

3.12 SAMPLE COLLECTION, PROCESSING AND STORAGE

Blood samples (5mls) were collected into EDTA tubes at each site from participants after informed consent and interview. Samples were sent to the Ankaful psychiatric hospital's laboratory and plasma was separated by centrifuging the whole blood at 1600 g for eight minutes. Plasma was aliqoted into apendorf tubes, labeled and stored at -20 degree Celsius.

3.12.1 HIV Screening

3.12.1.1 One Step Anti-HIV (1 and 2) Tri-line Test

All samples were initially screened for the presence of antibody to HIV-1 and HIV-2 using One Step Anti-HIV (1 and 2) Tri-line Test. The One Step Anti-HIV (1 and 2) Tri-line Test is a colloidal gold enhanced rapid immunochromatographic assay for detecting antibodies of all isotypes (IgG, IgM, IgA) to HIV (1 and 2). The test card has a sample well which contains a recombinant HIV antigen conjugated to colloidal gold. Upon application of HIV

positive plasma, serum or whole blood to the well, antibodies to HIV binds to the recombinant HIV antigen conjugated to the colloidal gold resulting in the formation of conjugate-HIV antibody complex. Addition of sample diluent helps the conjugate-HIV antibody complex to migrate along the card membrane. The card membrane has three regions; the HIV-1 (T1), HIV-2 (T2) and the control, (C) region. The T1 region has recombinant antigens gp41, p24 and gp120 immobilized to it, and as the conjugate-HIV antibody complex migrates along this region, the conjugated antibodies binds to the immobilized antigens resulting in the formation of colored test line indicating HIV positive test results. The T2 region has a recombinant gp36 antigen which is specific to HIV-2 immobilized in it, and as the conjugate-HIV antibody complex migrates along this region, a colored line develops indicating HIV-2 positive test results. The control region has anti-HIV antibodies immobilized in it and there is a color development irrespective of test results. The color development is an indication that the conjugate (the recombinant HIV antigen in the sample well) is potent, and the color is as a result of the conjugate binding to the immobilized antibodies (One Step Anti-HIV1 and 2 Tri-line Test manual).

The test was carried out in accordance with the manufacturer's instructions.

3.12.1.2 OraQuick® ADVANCE Rapid HIV-1/2 antibody test

All reactive samples from the One Step Anti-HIV1 and 2 Tri-line Test (First Response) were retested with OraQuick® ADVANCE Rapid HIV-1/2 Antibody Test (OraSure Technologies, Inc. USA) for confirmation. The OraQuick® ADVANCE Rapid HIV-1/2 Antibody Test kit is made up of a test card, developer solution vial, specimen collection loop, and a test stand. The test card has a sample pad for adsorption of specimen, protein A colloidal gold conjugate, and a nitrocellulose strip containing two test regions and a control region. A recombinant HIV-1 glycoprotein gp41 have been immobilized in the Test region one (T1). Test region 2 contains HIV-2 envelope glycoprotein gp36, while the control region

contains goat antihuman IgG. The test was carried out by picking a loopful of plasma into the developer solution vial using the sample collection loop. The developer vial solution was shaken gently to obtain a uniform solution. The diluted sample was put into the test stand and the test card was then inserted into the diluted sample using the flat pad, and incubated for 20 minutes. During the incubation period, the sample pad in the test card adsorbs the diluted sample and as it flows through the test device the protein, A colloidal gold conjugate becomes hydrated. If HIV antibodies are present in the sample, they bind to the protein A colloidal gold conjugate and the complex formed migrates along the nitrocellulose membrane. The HIV antibodies- protein A colloidal gold conjugate complex binds to the immobilized recombinant antigens in the test region which results in color development. If the sample contains no HIV antibodies no color develops at the test region. Other human IgG (which is not specific to HIV) present in the sample binds to the protein A colloidal gold conjugate as well, and as the complex migrate to the test region, the human IgG binds the goat antihuman antibodies and color develops. Color development at the control region is an indication that the result is valid. After 20 minutes of incubation, samples that tested negative were considered indeterminate and therefore tested again using the Genscreen™ ULTRA HIV Ag-Ab (Bio-Rad Laboratories, CA). The test was carried out using manufacturer's protocol.

3.12.2 Hepatitis B Screening

3.12.2.1 Accu-Tell One Step HBsAg rapid test

Samples (plasma) were screened for HBsAg using the Accu-Tell One Step HBsAg rapid test (AccuBio Tech Co., Ltd.,). The Accu-Tell One Step HBsAg rapid test employs sandwich immunoassays in the detection of HBsAg in serum or plasma. Antigens in sample bind to recombinant anti HBsAg antibodies conjugated to colloidal gold particles in the sample well and resulting mixture move alone the cellulose membrane which contains the test region

and the control region. If the samples contain HBsAg, the HBsAg in the HBsAg-HBsAb-conjugate complex binds to the anti- HBsAg antibodies

immobilized in the test region and a color develops which indicates positive results. Color development at both test and control region indicates valid positive test results and color development at the control region alone is an indication of valid negative test results. All positive samples were confirmed using Roche COBAS e411 analyzer with elecsys HBsAg II quant test (Roche Diagnostics, Germany).

3.12.3 Hpatitis C screening

3.12.3.1 Rapi Dip Insta Test

This HCV Rapid Test is a OneStep Anti HC Rapi Dip Insta Test (3.5mm) that is a direct binding test for the visual detection of hepatitis C antibodies (anti-HCV) in the serum. This test is based on the principle of double antigen sandwich immunoassay for determination of anti-HCV in serum. Purified recombinant antigens are employed to identify anti HCV specifically. This HCV Rapid Test takes between 10-20 minutes for the results to be read. For serum, collect blood into a container without anticoagulant. Allow the blood to clot, and then separate the serum from the clot. If the specimen cannot be tested on the day of collection, store the serum specimen in a refrigerator or freezer. Stir and bring the specimen to room temperature before testing. If the test result is negative, only one coloured band appears on the control C region of the test and there is no apparent band on the test (T) region. If the HCV Rapid test is positive, in addition to the pinkcoloured control C band, a distinct pink-coloured and will appear on the test (T) region of the test.

3.12.4 Syphilis Screening

3.12.4.1 Accu-Tell One Step Anti-Treponema Pallidum test

Samples were screened for syphilis using Accu-Tell One Step Anti-Treponema Pallidum test (AccuBio Tech Co., Ltd.,). This rapid test employs the sandwich principle in detecting

antibodies to *Treponema pallidum* in serum. The test card has a sample well in which *Treponema pallidum* antigen (TP Ag 1) conjugated with colloidal gold particles has been immobilized. A recombinant *Treponema pallidum*antigens (TP Ag 2) has been immobilized in the test region and anti- *Treponema pallidum* antibodies in the control region. On application of the test sample, the anti- *Treponema pallidum* antibodies bind to the conjugated TP Ag 1 which forms a colored mixture. As the colored mixture migrate chromatographically along the nitrocellulose membrane in the card, if the test sample contains anti- *Treponema pallidum* antibodies, the antibodies bind to the TP Ag 2 in the test region and a color develops indicating a positive results. No color development is an indication of negative results. As the mixture migrate to the control region the TP Ag 1 in the conjugate binds to the immobilized antibodies in the control region and a color develops. Color development in the control region is an indication that the TP Ag 1/colloidal gold conjugate is potent. Color development at the test and control region is an indication of valid positive results. Color development at the control region alone is an indication of valid negative results; however color development at the test region alone indicates invalid test results.

3.13 STATISCAL ANALYSIS

Analysis and statistical procedures were carried out using the Statistical Package for Social Sciences program (SPSS, version 21.0 for windows). Results are expressed as frequency with percentages in parenthesis. Chi-square (*2) statistic test was used to compare all categorical variables. Multivariate logistic regression was also use to determine risk factors influencing the acquisition and spread of HIV, HBV, HCV and

Syphilis infections among people with psychiatric disorders at the Ankaful Psychiatric Hospital.

CHAPTER 4

4.0 RESULTS

This study was undertaken to determine the prevalence of HIV, HBV, HCV and Syphilis infections and its related risk factors among people with psychiatric disorders at the Ankaful psychiatric hospital. The following results were obtained.

Table 1: below is the background characteristics of the subjects studied. Out of 200 subjects, 55.0% (n=110) of the subjects were males whilst 45.0% (n=90) of the subjects were females. Most of the subjects were in the age groups of 20-29 representing 33.5% (n=67) followed by 30-39 years of age representing 31.0% (n=62) as compared to subjects 4.5% (n=9) who were above sixty (60) years. The mean age of subjects enrolled in the study was 35.60. Most of the subjects surveyed during the study were single representing 61.0% (n=122) with males recording the highest with 65.6% (n=80) as compared to females 34.4% (n=42). Subjects who were married comes next with 30.5% (n=61) followed by the divorced and the widowed with 4.5% (n=9) and 4.0% (n=8) respectively. Majority of the subjects 38.0% (n=76) have completed the basic level of education followed by 19.0% (n=38) of the subjects who have completed secondary level of education and 19.0% (n=38) of the subjects have completed the tertiary level of education. Twenty one (21) out of 200 subjects surveyed representing 10.5% have never received any form of education. Concerning employment, a little over half of the subjects were employed before admission or being diagnosed with psychiatric disorders i.e. 55.5% (n=111) whilst subjects 44.5% (n=89) were not employed before they were diagnosed of psychiatric disorders. Almost all the subjects 96.0% (n=192) were Ghanaians whilst 4.0% (n=8) were foreigners from Ivory Coast, Nigeria and Niger respectively. With regards to religion, most of the subjects 89.5% (n=179) were Christians 8.0% (n=16) were Muslims,

0.5% (n=1) subscribed to the Traditional religion and 2.0% (n=4) subscribed to none of the religion. Majority of the subjects 48.0% (n=96) have not given birth before whilst subjects 33.5% (n=67) have given birth from 1-3 children, 16.0% (n=32) of the subjects have given birth from 4-6 children whilst 5% of the subjects have given birth to more than six children.

Table 4.1: Background characteristics of the people with psychiatric disorders at the Ankaful psychiatric hospital.

	Male (n = 110)	**Female** (n = 90)	**Total** (n = 200)
Age (years)	33.28 ± 10.88	38.43 ± 12.87	35.60 ± 12.06
Age group n (%)			
<20	5 (55.6)	4 (44.4)	9 (4.5)
20-29	45 (67.2)	22 (32.8)	67 (33.5)
30-39	34 (54.8)	28 (45.2)	62 (31.0)
40-49	15 (48.4)	16 (51.6)	31 (15.5)
50-59	7 (31.8)	15 (68.2)	22 (11.0)
≥ 60	4 (44.4)	5 (55.6)	9 (4.5)
Marital status			
Single	80 (65.6)	42 (34.4)	122 (61.0)
Married	25 (41.0)	36 (59.0)	61 (30.5)
Divorced	4 (44.4)	5 (55.6)	9 (4.5)
Widowed	1 (12.5)	7 (87.5)	8 (4.0)
Educational Level			
None	6 (28.6)	15 (71.4)	21 (10.5)
Basic	36 (47.4)	40 (52.6)	76 (38.0)
Secondary	42 (64.6)	23 (35.4)	65 (32.5)
Tertiary	26 (68.4)	12 (31.6)	38 (19.0)
Employment			
Yes	58 (52.3)	53 (47.7)	111 (55.5)
No	52 (58.4)	37 (41.6)	89 (44.5)
Nationality			
Ghanaian	107 (55.7)	85 (44.3)	192 (96.0)
Ivorian	1 (16.7)	5 (83.3)	6 (3.0)
Nigerian	1 (100)	0 (0.0)	1 (0.5)
Niger	1 (100)	0 (0.0)	1 (0.5)
Number of children			
None	70 (72.9)	26 (27.1)	96 (48.0)
1-3	32 (47.8)	35 (52.2)	67 (33.5)
4-6	8 (25.0)	24 (75.0)	32 (16.0)
>6	0 (0.0)	5 (100)	5 (2.5)
Religion			
None	3 (75.0)	1 (25.0)	4 (2.0)
Christian	96 (53.6)	83 (46.4)	179 (89.5)
Islam	10 (62.5)	6 (37.5)	16 (8.0)
Traditional	1 (100)	0 (0.0)	1 (0.5)

Table 2: below summarizes the seroprevalence of HIV, HBV, HCV and Syphilis infections among subjects surveyed. Overall seroprevalence was 5.0% (n=10) for HIV, 9.5% (n=19) for HBV, 2.0% (n=4) for HCV and 13.5% (n=27) for Syphilis. With regards to multiple infections, subjects recorded 0.5% for HBV + Syphilis, 1.0% for HBV+HIV, 0.5% for HCV+ Syphilis and 0.5% for HIV+ HBV+ Syphilis respectively.

Table 4.2: Seroprevalence of HIV, HBV, HCV and Syphilis infections among people with psychiatric disorders at the Ankaful psychiatric hospital.

Variable	N (%)
HIV Status	
Reactive	10 (5.0)
Non-Reactive	190 (95.0)
HBV Status	
Positive	19 (9.5)
Negative	181 (90.5)
HCV Status	
Positive	4 (2.0)
Negative	196 (98.0)
Syphilis Status	
Reactive	27 (13.5)
Non-Reactive	173 (86.5)
Multiple infections	
HBV + Syphilis	1 (0.5)
HBV + HIV	2 (1.0)
HCV + Syphilis	1 (0.5)
HIV + HBV + Syphilis	1 (0.5)

Table 3: below summarizes the seroprevalence of HIV, HBV, HCV and Syphilis infections in relation to background characteristics of the subjects surveyed.

4.1 SEROPREVALENCE OF HIV INFECTION IN RELATION TO BACKGROUND CHARACTERISTICS

Seroprevalence of HIV infections was found to be 5.0%; female subjects represented 70.0% of all HIV positive subjects as compared to male subjects (30.0%). The two youthful age groups (i.e. 20-29, 30-39) recorded more positive HIV infections representing 30% & 40% respectively as compared to these age groups (i.e. less than 20, 50-59 & more than 60) with

0.0%, 10.0% and 0.0% respectively. Subjects who were single and married had equal chance of HIV infections with (50.0%) each.

Concerning the level of education, majority of the subjects (60.0%) have completed the basic level of education, 10.0% of the subjects have not had any form of education, followed by subjects who have completed secondary (10.0%) and tertiary (20.0%) education respectively. With regards to HIV infections and the type of psychiatric diagnosis, subjects with schizophrenia were found to be more positive recording (60.0%) followed by subjects with depression (20.0%) and subjects with bipolar disorder also recording (10.0%). Majority of the subjects who were infected with HIV were diagnosed with psychiatric disorders between the duration of less than five years recording (40.0%), 5-10 years recording (40.0%) and more than sixteen years recording (20.0%) respectively.

4.2 SEROPREVALENCE OF HEPATITIS B VIRUS IN RELATION TO BACKGROUND CHARACTERISTICS

Out of the total subjects surveyed, 9.5% were positive to HBV infection and majority of the subjects were males (52.6%) whilst females were (47.4%). In relation to age distributions, these groups recorded more positive infections for HBV 20-29 years recorded (36.8%) and 30-39 years recorded (47.4%). Single subjects (63.2%) were more infected with HBV as compared to subjects (31.6%) who were married. There was significant difference between subjects (5.3%) who had no form of education followed by subjects (36.8%) with basic education and subjects (31.6% & 26.3%) who have completed the secondary and tertiary education respectively. Subjects (63.2%) who were employed recorded more infection with HBV as compared to the unemployed subjects (36.8%). Concerning the type of psychiatric disorders of the subjects surveyed in relation to HBV infection, subjects with schizophrenia recorded (42.1%), subjects with bipolar disorder recorded (21.1%) subjects with substance abuse (15.8%) and seizure disorder also recording (15.8%) respectively. Majority of the

subjects (47.4% & 31.6%) infected with HBV were diagnosed with psychiatric disorders in the duration of less than five years and between 5-10 years respectively.

4.3 SEROPREVALENCE OF HEPATITIS C VIRUS IN RELATION TO BACKGROUND CHARACTERISTICS

Hepatitis C recorded 2.0% (n=4) of infection out of the total 200 subjects surveyed. Males (75.0%) dominated as compared to females (25.0%). Subjects were infected with HCV were in these age categories; 20-29 years recording (50.0%) and 30-39 years recording (25.0%) respectively. All subjects (100.0%) infected with HCV were single. 50.0% of the subjects have completed the secondary level of education followed by subjects (25.0%) who have completed tertiary education and subjects (25.0%) with no form of education recording each. All subjects (100%) who were positive to HCV infections were unemployed. Concerning the type of psychiatric disorders of subjects in relation to HCV infections, schizophrenia recorded (50.0%) followed by substance use/abuse disorders and psychotic disorders with (25.0%) each. 50.0% of subjects infected with HCV had been diagnosed of psychiatric disorders from 5-10 years.

4.4 SEROPREVALENCE OF SYPHILIS INFECTION IN RELATION TO BACKGROUND CHARACTERISTICS

Syphilis infections recorded the highest prevalence amongst all the infectious diseases surveyed with 13.5% (n=27) as compared to 5.0% (n=10) for HIV, 9.5% (n=19) for HBV, and 2.0% (n=4) for HCV. Majority of the subjects (55.6%) who tested positive to Syphilis infection were females whilst male subjects recorded (44.4%). In relation to seroprevalence of Syphilis to age distributions, subjects of these age groups; 30-39 & 2029 years recorded the highest infection rate with (40.7%) and (22.2%) respectively. Majority of the subjects (40.7%) who were positive to Syphilis infections were married as compared to subjects (37.0%) who were single. Concerning education and seroprevalence of Syphilis infection,

majority of the subjects (55.6%) have completed the basic education, followed by subjects (18.5%) with no form of education. Majority of the subjects (63.0%) who tested positive to Syphilis infections were employed as compared to the subjects (37.0%) who were unemployed. In relation to the subjects who were positive to Syphilis infections and the type of psychiatric disorders diagnosed, subjects with schizophrenia recorded (29.6%); bipolar disorder (18.5%), depression (18.5%) and psychotic disorder (18.5%) respectively.

Table 4.3: Seroprevalence of HIV, HBV, HCV and Syphilis infections in relation to background characteristics of the people with psychiatric disorders at the Ankaful psychiatric hospital.

Characteristics	HIV (n = 10)	HBV (n = 19)	HCV (n = 4)	Syphilis (n = 27)
Gender Male				
	3 (30.0)	10 (52.6)	3 (75.0)	12 (44.4)
Female	7 (70.0)	9 (47.4)	1 (25.0)	15 (55.6)
Age group n (%) <20				
	0 (0.0)	0 (0.0)	0 (0.0)	1 (3.7)
20-29	3 (30.0)	7 (36.8)	2 (50.0)	6 (22.2)
30-39	4 (40.0)	9 (47.4)	1 (25.0)	11 (40.7)
40-49	2 (20.0)	2 (10.5)	0 (0.0)	4 (14.8)
50-59	1 (10.0)	1 (5.3)	1 (25.0)	3 (11.1)
≥ 60	0 (0.0)	0 (0.0)	0 (0.0)	2 (7.4)
Marital status				
Single	5 (50.0)	12 (63.2)	4 (100)	10 (37.0)
Married	5 (50.0)	6 (31.6)	0 (0.0)	11 (40.7)
Divorced	0 (0.0)	1 (5.3)	0 (0.0)	2 (7.4)
Widowed	0 (0.0)	0 (0.0)	0 (0.0)	4 (14.8)
Educational Level None				
	1 (10.0)	1 (5.3)	1 (25.0)	5 (18.5)
Basic	6 (60.0)	7 (36.8)	0 (0.0)	15 (55.6)
Secondary	1 (10.0)	6 (31.6)	2 (50.0)	5 (18.5)
Tertiary	2 (20.0)	5 (26.3)	1 (25.0)	2 (7.4)
Employment				
Yes	3 (30.0)	12 (63.2)	0 (0.0)	17 (63.0)
No	7 (70.0)	7 (36.8)	4 (100)	10 (37.0)
Psychiatric Diagnosis				
Type of disorder				
Psychotic disorder	0 (0.0)	1 (5.3)	1 (25.0)	5 (18.5)
Bipolar	1 (10.0)	4 (21.1)	0 (0.0)	5 (18.5)
Substance abuse	0 (0.0)	3 (15.8)	1 (25.0)	1 (3.7)
Seizure disorders	1 (10.0)	3 (15.8)	0 (0.0)	1 (3.7)
Schizophrenia	6 (60.0)	8 (42.1)	2 (50.0)	8 (29.6)
Depression	2 (20.0)	0 (0.0)	0 (0.0	5 (18.5)
Others	0 (0.0)	0 (0.0)	0 (0.0)	2 (7.4)
Duration of Disorder				
<5	4 (40.0)	9 (47.4)	1 (25.0)	16 (59.3)
5-10.	4 (40.0)	6 (31.6)	2 (50.0)	6 (22.2)
11-16.	0 (0.0)	1 (5.3)	1 (25.0)	3 (11.1)
>16	2 (20.0)	3 (15.8)	0 (0.0)	2 (7.4)

Table 4.4: Results on Hepatitis B Profile (Combo) Test

CLINICAL CONDITIONS	NUMBER OF PATIENTS (19)	HBsAg	HBsAb	HBeAg	HBeAb	HBcAb
Chronic Hepatitis	2 (10.5%)	positive	negative	-	-	positive
Acute Hepatitis	2(10.5%)	positive	negative	positive	negative	positive
Asymptomatic carrier	15(79.0%)	positive	negative	negative	positive	positive
Past Infection, Immunity	-	negative	positive	negative	Pos/neg	Positive
Past Immunization	-	positive	negative	negative	negative	negative

Table 4.0 above analyzes Hepatitis B profile test of the subjects who were positive to HBsAg test. The test was done to confirm positivity and also to determine the subject's clinical conditions. Majority of the subjects (79.0%) were asymptomatic carriers whilst 10.5% each of the subjects were with acute and chronic hepatitis respectively. None of the subjects (0.00%) recorded either past infection and immunity or past immunization. Table 5: below shows the sexual lifestyles of subjects as risk factors influencing the acquisition and spread of HIV, HBV, HCV and Syphilis infections.

With regards to HIV infections, all the subjects (100%) were heterosexuals. In relation to the number of sexual encounters men have had in a whole life, 20.0% of the subjects recorded more than ten sexual encounters whilst 10.0% of the subjects recorded between 5-10 sexual encounters. Concerning the number of sexual encounters women have had in a whole life, 40.0% of the subjects recorded more than ten sexual encounters in a whole life, 10.0% of the subjects recorded less than five sexual encounters whilst 30.0% of the subjects recorded no sexual encounters. 90.0% of the subjects positive to HIV were recorded for having regular sexual partner/partners whilst 10.0% of the subjects were recorded for not having regular sexual partner/partners.

With respect to sexual lifestyles as a risk factor influencing the acquisition and spread of HBV infections, 94.7% of the subjects who were positive to HBV were heterosexuals, whilst 5.3% of the subjects were homosexuals. Concerning the number of sexual encounters male subjects have had in a whole life, 36.8% of the subjects recorded more than ten sexual encounters, 10.5% each of the subjects recorded from 5-10 and less than five sexual encounters respectively. In relation to female sexual encounters in a whole life, 10.5% to the subjects recorded more than ten sexual encounters, 15.8% of the subjects recorded less than five sexual encounters whilst 52.6% of the subjects recorded no sexual encounters. Majority of the subjects (52.6%) have regular sexual partner/s as compared to subjects (47.4%) who do not have regular sexual partner/s.

With regards to sexual lifestyles as a risk factor influencing the acquisition and spread of HCV infections, all the subjects (100%) were heterosexuals. In relation to the number of sexual encounters female subjects have had in a whole life, 25.0% of the subjects recorded more than ten sexual encounters whilst 25.0% of the subjects recorded from 5-10 sexual encounters. Concerning sexual encounters male subjects have had in a whole life, 25.0% of

the subjects' recorded more than ten sexual encounters whilst 75.0% of the subjects recorded no sexual encounters. Subjects (25.0%) positive to HCV infection have regular sexual partner/s as compared to majority of the subjects (75.0%) who do not have regular sexual partners.

Concerning sexual lifestyles as risk factors influencing the acquisition and spread of Syphilis infection, all the subjects (100%) where positive to Syphilis infection were heterosexuals. With regards to the number sexual encounters female subjects have had in a whole life, 11.1% of the subjects have had less than five sexual encounters and 7.4% of the subjects recorded between 5-10 sexual encounters. Additionally, with regards to sexual encounter male subjects have had in a whole life, 33.3% of the subjects have had more than ten sexual encounters, 18.5% of the subjects have had from 5-10 sexual encounters, 3.7% of the subjects have had less than five sexual encounters. 37.0% of all subjects positive to Syphilis have regular sexual partners whilst 63.0% of the subjects have no regular sexual partner/s.

Table 5: Sexual lifestyles as risk factors influencing the acquisition and spread of HIV, HBV, HCV and Syphilis infections among people with psychiatric disorders

Characteristics	HIV (n = 10)	OR	Pvalue	HBV (n = 19)	OR	P-value	HCV (n = 4)	OR	Pvalue	Syphilis (n = 27)	OR	Pvalue
Sexual Orientation												
Heterosexual	10 (100)	2.6×10^7	0.998	18 (94.7)	4.40 x 107	<0.0001	4 (100)	9.52×10^6	0.999	27 (100)	8×10^7	0.998
Homosexual	0 (0.0	1.0	-	1 (5.3)	2.15 x108	-	0 (0.0)	1.0	-	0 (0.0)	1.0	-
Bisexual*	0 (0.0)	1		0 (0.0)	1		0 (0.0)	1		0 (0.0)	1	
Sexual encounters (women)												
None*	7 (70.0)	1		8 (42.1)	1		2 (50.0)	1		16 (59.3)	1	
<5	0 (0.0)	3.02×10^9	-	2 (10.5)	1.02	0.977	0 (0.0)	-	-	3 (11.1)	0.73	0.644
5-10.	1 (10.0	0.54	0.574	2 (10.5)	0.98	0.978	1 (25.0)	2	0.578	2 (7.4)	0.44	0.302
>10	2 (20.0)	0.44	0.311	7 (36.8)	1.45	0.499	1 (25.0)	0.79	0.851	6 (22.2)	0.55	0.244
Sexual encounters (men)												
None*	3 (30.0)	1		10 (52.6)	1		3 (75.0)	1		12 (44.4)	1	
<5	1 (10.0)	2.71	0.401	3 (15.8)	2.68	0.175	0 (0.0)	-	-	1 (3.7)	0.63	0.663
5-10.	2 (20.0)	4.47	0.115	4 (21.1)	2.85	0.108	0 (0.0)	-	-	5 (18.5)	3.13	0.059
>10	4 (40.0)	3.38	0.12	2 (10.5)	0.46	0.322	1 (25.0)	0.79	0.841	9 (33.3)	1.97	0.157
Regular sexual partner (s)												
Yes	9 (90.0)	14.11	0.013	10 (52.6)	1.64	0.304	1 (25.0)	0.46	0.509	10 (37.0)	0.81	
No*	1 (10.0)	1		9 (47.4)	1		3 (75.0)	1		17 (63.0)	1	

Table 6: shows knowledge of HIV, HBV, HCV and Syphilis infections as risk factors influencing the acquisition and spread of these diseases.

Concerning the knowledge on HIV and AIDS, all the subjects (100%) positive to HIV have ever heard of HIV and AIDS and their sources of information was mainly through the electronic media (100%). With regards to HIV transmission, 90.0% of the subjects recorded through heterosexual intercourse, whilst 10.0% of the subjects recorded through anal sexual intercourse. Majority of the subjects (60.0%) have not had blood test for HIV as compared to 40.0% of the subjects who have ever had blood test for HIV. Few of the subjects (20.0%) have heard of ARTs as compared to majority of the subjects (80.0%) who have never heard of ARTs and all the subjects (100%) recorded that ARTs cannot cure HIV and AIDS.

With regards to knowledge of HBV and the risk of infections, majority of the subjects (63.2%) have heard of HBV as compared to 36.8% of the subjects who have not heard of HBV. In relation to the sources of information of subjects, 73.7% of the subjects recorded through the electronic media, 15.8% of the subjects recorded through the print media and 10.5% of the subjects also recorded through family/friends. With regards to the mode of transmission, 42.1% of the subjects recorded through sharing of razors and toothbrushes, 15.8% of the subjects recorded through blood transfusion, 15.8% of the subjects also recorded through anal sex and 26.3% of the subjects recorded through heterosexual intercourse. Majority of the subjects (84.2%) have never had blood test for HBV as whilst 15.8% of the subjects have ever had blood test for HBV. Majority of the subjects (94.7%) have not been vaccinated against HBV as compared to 5.3% of the subjects who have been vaccinated.

Concerning knowledge about HCV infections, half of the subjects (50.0%) positive to HCV have heard of the virus as compared to the other half of the subjects (50.0%) who have not heard of the HCV. Subject's sources of information were recorded to be 50.0% for electronic media, 25.0% for both print media and family/friends respectively. With respect to the mode of transmission of HCV, 50.0% of the subjects recorded through heterosexual intercourse, 25.0% each of the subjects recorded for both anal sex and through sharing of razors/toothbrushes. All the subjects (100%) who were positive to HCV have never had blood test for HCV before.

In relation to knowledge about Syphilis infections, 55.5% of the subjects have heard of Syphilis whilst 44.5% of the subjects have never heard of Syphilis infection. Subject's sources of information were found to be 40.7% for print media, 37.0% for electronic media and 22.3% for family/friends. With respect to the mode of transmission of Syphilis, 63.0% of the subjects recorded through heterosexual intercourse, 18.5% each of the subjects recorded for both anal sex and through blood transfusion. Majority of the subjects (85.2%) who were positive to Syphilis have never had blood whilst 14.8% of the subjects have had blood test for Syphilis before.

Characteristics	HIV	OR	P-value	HBV	OR	P-value	HCV	OR	P-value	Syphilis	OR	P-value
Knowledge of HIV/AIDS, HBV, HCV and Syphilis.												
Yes	10 (100)	-	-	(63.2)	0.77	0.599	(50.0)	1.51	0.682	(55.5)	1.52	0.407
No*	0 (0.0)	1		(36.8)	1		(50.0)	1		(44.5)	1	
Source of information.												
Print media	0 (0.0)	1		(15.8)	1.29	0.705	(25.0)	2.28	0.483	(40.7)	0.53	0.147
Electronic media	10 (100)	-	-	(73.7)	0.93	0.889	(50.0)	0.32	0.267	(37.0)	0.72	0.533
Family/Friends	1 (10.0)	0.4	0.396	(15.8)	0.68	0.56	(25.0)	1.26	0.843	(22.3)	0.39	0.057
School/Church*	0 (0.0)	-	-	(0.0)	1	-	(0.0)	1	-	(0.0)	1	
Mode of transmission.												
Through heterosexual	9 (90.0)	3.13	0.285	(89.5)	3.07	0.144	(50.0)	0.32	0.267	(63.0)	2.61	0.070
Through anal sex	2 (20.0)	0.63	0.566	(42.1)	2.02	0.156	(25.0)	0.86	0.893	(18.5)	0.23	0.003
During pregnancy*	0 (0.0)	1		(0.0)	1		(25.0)	1		(0.0)	1	
Sharing toothbrushes and razors	3 (30.0)	0.7	0.617	(42.1)	1.24	0.663	(50.0)	1.69	0.606	(0.0)	-	-
Blood transfusion	1 (10.0)	0.67	0.71	(15.8)	1.17	0.813	(0.0)	-	-	(18.5)	02.3	0.002
Blood test for HIV, HBV, HCV and Syphilis.												
Yes	4 (40.0)	1.17	0.814	(15.8)	1.51	0.54	(0.0)	-	-	(14.8)	0.25	0.006
No*	6 (60.0)	1		(84.2)	1		(100)	1		(85.2)	1	
Knowledge about Antiretroviral drugs (ART) for HIV and AIDS.												
Yes	2 (20.0)	0.61	0.545									
No*	8 (80.0)	1										
Can ARTs cure HIV and AIDS?												
Yes	0 (0.0)	-	-									
No*	10 (100)	1										
HBV vaccination.												

Yes	1 (5.3)	1.96	0.55
No*	18 (94.7)	1	

Table 4.6: Knowledge on HIV, HBV and HCV as risk factors influencing the acquisition and spread of HIV, HBV and HCV infections

Table 7: below shows substance use/abuse behaviour as risk factors influencing the acquisition and spread of HIV, HBV, HCV and Syphilis infections.

With regards to HIV infection and substance use/abuse, 20.0% of the total subjects positive to HIV were found to be drinking alcohol not often as compared to majority of the subjects (80.0%) who do not take alcohol at all. In relation to sex whiles high on drugs or alcohol, 20.0% of the subjects have had sex whilst their partners were high on drugs or alcohol as compared to 10.0% of the subjects who had sex while they were high on drugs or alcohol. None of the subjects (0.0%) were found to have ever used drugs and also had sex with a partner who have drug or alcohol problem.

Concerning HBV infections and substance use/abuse, 42.1% of the subjects were found to have ever used drugs as compared to 57.9% of subjects who have never used drugs. With respect to the duration of drug use, 31.6% of the subjects have use drugs for more than 5 years whilst 10.5% of the subjects have use drugs for less than five years. In relation to alcohol intake, 31.6% of the subjects were found to be drinking alcohol more often, 42.1% of the subjects were found to be drinking but not often as compared to 26.3% of the subjects who do not take alcohol at all. Concerning needle/razor sharing after someone else have used it, 10.5% of the subjects were found to have ever shared needles/razors after someone else have used it whilst majority of the subjects (89.5%) had never shared needles/razors after someone else have used it. Concerning sex whilst high on drugs or alcohol, 31.6% of the subjects recorded having sex whilst their partners were high on drugs or alcohol as compared to 26.3% of the subjects recorded having sex whilst they were high on drugs or alcohol. Additionally, 10.5% of the subjects recorded ever having sex with a partner with drug or alcohol problem. None of the subjects (0.0%) positive to HBV recorded ever injecting drugs apart from prescribed drugs.

With regards to substance use/abuse and HCV infections, 25.0% of the subjects drink alcohol more often whilst 75.0% of the subjects do not take at all. In relation to sex whilst high on drugs or alcohol, 25.0% of the subjects recorded having sex whiles they were high on drugs or alcohol and 25.0% of the subjects recorded having sex whilst their partners were high on drugs or alcohol. None of the subjects (0.0%) who were positive to HCV recorded ever using drugs, sharing of needles/razors and having sex with a partner with drug or alcohol problem.

Concerning substance use/abuse and Syphilis infections, 18.5% of the subjects were found to have ever used drugs whilst subjects 81.5% have never used drugs. With regards to the duration of drug use, 14.8% of the subjects have used drugs for more than ten years, 3.7% of the subjects have used drugs for less than five years. Additionally, 22.2% of the subjects positive to Syphilis were found to be drinking alcohol more often as compared to 40.7% of the subjects who have never taken alcohol before. Concerning injection drugs apart from prescribed drugs, 3.7% of the subjects were found to have ever injected drugs as compared to 96.3% of the subjects who have never injected drugs apart from prescribed drugs. 7.8% of the subjects have ever used needle/razors after someone else have used it as compared to majority of the subjects (92.6%) who have never shared needle/razors after someone else have used it. In relation to sex whilst high on drugs or alcohol, 7.4% of the subjects recorded having sex whilst their partners were high on drugs or alcohol whilst 11.1% of the subjects have sex with their partners whiles they were high on drugs or alcohol. Additionally, 3.7% of the subjects recorded having sex with a partner with drug or alcohol problem.

Table 4.7: Substance use behavior as risk factors influencing the acquisition and spread of HIV, HBV, HCV and Syphilis

Characteristics	HIV	OR	P-value	HBV	OR	P-value	HCV	OR	P-value	Syphilis	OR	P-value
History of smoking.												
Yes	0 (0.0)	$1.29x10^{-9}$	-	8 (42.1)	2.93	0.032	0 (0.0)	-	-	5 (18.5)	0.78	0.639
No*	10 (100)	1		11 (57.9)	1		4 (100)	1		22 (81.5)	1	
Duration of smoking.												
Not at all*	10 (100)	1		11 (57.9)	1		4 (100)	1		22 (81.5)	1	
<5	0 (0.0)	0.34	0.185	2 (10.5)	1.39	0.685	0 (0.0)	-	-	1 (3.7)	0.31	0.258
≥ 5	0 (0.0)			6 (31.6)	4.65	0.007	0 (0.0)	-	-	4 (14.8)	1.28	0.677
History of alcohol.												
Not at all*	8 (80.0)	1		5 (26.3)	1		3 (75.0)	1		11 (40.7)	1	
Not often	2 (20.0)	-	-	8 (42.1)	2.51	0.121	0 (0.0)	-	-	10 (37.0)	1.38	0.493
More Often	0 (0.0)	-	-	6 (31.6)	2.85	0.099	1 (25.0)	0.71	0.774	6 (22.2)	1.21	0.728
History of injection drug use (IDU).												
Yes	0 (0.0)	-	-	0 (0.0)	-	-	0 (0.0)	-	-	1 (3.7)	2.18	0.507
No*	10 (100)	1		19 (100)	1		4 (100)	1		26 (96.3)	1	
Ever shared needles or injection implements.												
Yes	2 (20.0)	2.01	0.396	2 (10.5)	0.9	0.889	0 (0.0)	-	-	2 (7.4)	0.58	0.478
No*	8 (80.0)	1		17 (89.5)	1		4 (100)	1		25 (92.6)	1	
Ever had sex with drug user												
Yes	2(20.0)	1.07	0.934	6 (31.6)	2.15	0.149	1 (25.0)	1.43	0.759	2 (7.4)	0.3	0.117
No*	8 (80.0)	1		13 (68.4)	1		3 (75.0)	1		25 (92.6)	1	
Ever had sex whilst you were high on drugs or alcohol?												
Yes	1 (10.0)	0.57	0.6	5 (26.3)	2.04	0.205	1 (25.0)	1.77	0.624	3 (11.1)	0.62	0.46

No*	9 (90.0)	1		14 (73.7)	1		3 (75.0)	1	24 (88.9)	1	
Ever had sex with a partner with drug or alcohol problem?											
Yes	0 (0.0)	-	-	2 (10.5)	2.25	0.324	0 (0.0)		1 (3.7)	0.63	0.663
No*	10 (100)	1		17 (89.5)	1		4 (100)		26 (96.3)	1	

Table 8: below shows forced sex/ sex work and condom use as risk factors influencing the acquisition and spread of HIV, HBV, HCV and Syphilis infections.

With regards to HIV infections, half of the subjects (50.0%) positive to HIV have never used condoms before whilst the other half of the subjects (50.0%) have used condoms during sexual encounters. None of the subjects (0.0%) were found to have recorded for ever paid or been paid money for sex, ever been given food, shelter, or drugs in return for sex and ever been frightened or forced by a man or woman into doing something sexually they didn't want to do.

Concerning HBV infections, 5.3% of the subject's positive to HBV have ever been forced or frightened by a man or woman into doing something sexually that they didn't want to do as compared to 94.7% of the subjects have never been forced into sex. Also with the number of force sex, 5.3% of the subjects recorded from 3-4 times of force sex and above the age sixteen. With regards to paid sex, 15.8% of the subjects have ever paid or been paid for sex as compared to 84.2% of the subjects who have never paid or been paid for sex. Concerning condom use, majority of the subjects (57.9%) have not use condoms before during sexual encounters whilst 42.1% of the subjects have used condoms during sexual encounters. None of the subjects (0.0%) recorded ever been given food, shelter or drugs in return for sex.

Concerning HCV infections, 25.0% of the subject's positive to HCV have been forced or frightened by a man or woman into doing something sexually that they didn't want to do as compared to 75.0% of the subjects have never been forced into sex. Also with the number of force sex, 5.3% of the subjects recorded from 1-2 times of force sex and above the age sixteen. With regards to paid sex, 25.0% of the subjects have ever paid or been paid for sex as compared to 75.0% of the subjects who have never paid or been paid for sex. Concerning condom use, half of the subjects (57.9%) positive to HCV have not use

condoms before during sexual encounters whilst the other half of the subjects (50.0%) have ever used condoms during sexual encounters. None of the subjects (0.0%) recorded ever been given food, shelter or drugs in return for sex.

With regards to Syphilis infections, 25.9% of the subject's positive to Syphilis have been forced or frightened by a man or woman into doing something sexually that they didn't want to do as compared to 74.1% of the subjects have never been forced into sex. Also with the number of force sex, 18.5% of the subjects recorded from 1-2 times of force sex, 7.4% of the subjects recorded more than five times. With regards to paid sex, 7.4% of the subjects have ever paid or been paid for sex as compared to 92.6% of the subjects who have never paid or been paid for sex. Concerning condom use, majority of the subjects (51.9%) have not use condoms before during sexual encounters whilst 48.1% of the subjects have used condoms during sexual encounters. Additionally, 11.1% of the subjects positive to Syphilis have ever given food, shelter or drugs in return for sex whilst 88.9% of the subjects have never been given food, shelter or drugs in return for sex.

Table4.8: Forced sex/ Sex working as risk factors influencing the acquisition and spread of HIV, HBC, HCV and Syphilis infection

Characteristics HIV		OR	P-value	HBV	OR	P-value	HCV	OR	P-value	Syphilis	OR	P-value
History of forced sex?												
Yes	0 (0.0)	-	-	1 (5.3)	0.29	0.239	1 (25.0)	1.92	0.578	7 (25.9)	2.28	0.094
No*	10 (100)	1		18 (94.7)	1		3 (75.0)	1		20 (74.1)	1	
How often?												
None*	10 (100)	1		18 (94.7)	1		3 (75.0)	1		20 (74.1)	1	
1-2.	0 (0.0)	-	-	0 (0.0)	-	-	1 (25.0)	3.28	0.316	5 (18.5)	2.89	0.067
3-4.	0 (0.0)	-	-	1 (5.3)	2.11	0.514	0 (0.0)	-	-	0 (0.0)		
≥ 5	0 (0.0)	-	-	0 (0.0)			0 (0.0)	-	-	2 (7.4)	3	0.207
How old were you when it started?												
None*	10 (100)	1		18 (94.7)	1		3 (75.0)	1		20 (74.1)	1	
<16	0 (0.0)	-	-	0 (0.0)	-	-	0 (0.0)	-	-	2 (7.2)	2.5	0.281
≥ 16	0 (0.0)	-	-	1 (5.3)	0.4	0.387	1 (25.0)	2.65	0.408	5 (18.5)	2.21	0.159
Sex in exchange for money.												
Yes	0 (0.0)	-	-	3 (15.8)	2.08	0.286	1 (25.0)	3.51	0.288	2 (7.4)	0.79	0.756
No*	10 (100)	1		16 (84.2)	1		3 (75.0)	1		25 (92.6)	1	
Sex in exchange for food, shelter or drugs.												
Yes	0 (0.0)	-	-	0 (0.0)	-	-	0 (0.0)	-	-	3 (11.1)	2.58	0.183
No*	10 (100)	1		19 (100)	1		4 (100)	1		24 (88.9)	1	

Have you ever used condoms during sex?												
Yes	5 (50.0)	1.14	0.845	8 (42.1)	0.8	0.654	2 (50.0)	1.13	0.903	13 (48.1)	1.06	0.898
No*	5 (50.0)	1		11 (57.9)	1		2 (50.0)	1		14 (51.9)	1	

CHAPTER 5

5.0 DISCUSSIONS

People with psychiatric disorders appears to have increase rate of HIV, HBV, HCV and Syphilis infections since they lack knowledge about contraception and may make poorer decisions regarding sexual behaviours (Kalichman *et al*., 1994; Cournos *et al*., 1994). Research has shown that in general, people with psychiatric disorders are likely to indulge in high risk sexual practices such as injection drugs use, having multiple sexual partners, inconsistent condom use, engaging in same sex sexual activities, sex in exchange for money, shelter or drugs and engaging in sex whilst high on drugs or alcohol (Cary *et al*., 1995; Mckinnon *et al*., 1996).

Knowledge about prevalence, risk factors of HIV, HBV, HCV and Syphilis among people with psychiatric disorders is important for planning preventive, control and treatment programs. Furthermore, comparison of prevalence and risk factors among people with psychiatric disorders with some target groups and the general population in the same geographical area may help provide changes in health practices. This is the first study in Ghana to determine the prevalence of HIV, HBV, HCV, and syphilis infections among people with psychiatric disorders.

The 5.0% prevalence of HIV obtained in this study is higher than the 1.7% prevalence recorded in a study by Carey *et al*., (2007) to determine the prevalence of HIV, HBV and Syphilis infections among adults seeking treatment for a mental disorder in Southern India. However it is lower than the 11.3% prevalence recorded in a study conducted by Lundberg *et al*., (2014) among psychiatric patients in Uganda. The reasons to this may be due to difference in sample size, technique or the geographical area. Comparing the prevalence of HIV with target groups in the same geographical area, it is higher than the

0.98% prevalence recorded by Boahemaa, (2014) in a cross sectional study to determine the prevalence of HIV, HBV, Syphilis and its risk factors among truck drivers using the seaport at Tema in Ghana. It is also lower to what has been reported in Ghana among prisoners (17.4%). (Adjei *et al*., 2006) 15% and 11.59% among blood donors in Korle Bu Teaching Hospital and Tamale Teaching Hospital respectively (Ampofo *et al*., 2002; Dongdem *et al*., 2009). The 5.0% prevalence of HIV is higher than the general Ghanaian population (HIV Sentinel Surveillance Report, 2012 of the National AIDS/STI Control Program, Ghana Health Service).

The 9.5% prevalence of HBV recorded in this study is higher than 3.0% recorded in a study conducted by Carey *et al*., (2007) to determine the prevalence of HIV, HBV and Syphilis in adults seeking treatment for a mental disorder in Southern India. However it is lower than the 10.4% prevalence recorded by Hung *et al*., (2012) in a study conducted to determine the prevalence of Hepatitis B and Hepatitis C in patients with chronic schizophrenia living in institutions in Taiwan. The reasons to this difference in prevalence may be due to the sampling difference and the higher endemicity of the disease in the area. Concerning the prevalence of HBV of this study and other studies conducted among target groups in the same geographical area, the 9.5% prevalence of HBV is in line with the 8.68% recorded in a study by Amidu *et al*., (2012) in a prospective study conducted at Kumasi in Ghana. However it is lower than the 14.5% prevalence of HBV recorded in a cross sectional study conducted by Adoba *et al*., (2015) to determine the prevalence of HBV and poor knowledge on hepatitis B and C infections among barbers in the Obuasi municipality, Ghana.

The 2.0% prevalence of HCV is lower than the 5.7% prevalence of HCV recorded in a study by Almeida and Pedroso, (2004) to determine the prevalence of HIV, HBV, HCV and Syphilis infections among male patients with chronic mental illness in Brazil.

However it is higher than the 1.9% prevalence obtained in a study by Hung *et al*., (2012) to determine the prevalence of Hepatitis B and C in patients with chronic schizophrenia living in institutions in Taiwan. It is also higher than the 0.5% prevalence of HCV recorded by Adoba *et al*., (2015) in a cross-sectional study conducted to determine the prevalence of HBV and poor knowledge on hepatitis B and C viral infections among barbers in the Obuasi municipality, Ghana. It is also lower than the 2.3% HCV prevalence reported among blood donors by Walana *et al*., (2012) in a retrospective hospital-based study conducted in the Kintampo municipal, Ghana. The difference in the prevalence rate may be due to sample size and techniques.

The 13.5% prevalence of Syphilis infections is higher than the 3.3% prevalence recorded in a study by Cary *et al*., (2007) to determine the prevalence of HIV, HBV and Syphilis infections among adults seeking treatment for mental health disorder in Southern India. In relation to the prevalence of syphilis among target groups in the same geographical area, the 3.8% prevalence recorded was lower in a study conducted to determine the prevalence of HIV, Syphilis, hepatitis B, and risk factors among truck drivers in Tema, Ghana. This study therefore adds to the evidence that people with psychiatric disorders are indeed at risk of HIV, HBV, HCV and syphilis infections (Omoregie *et al*., 2009; Henning *et al*., 2011; Naber et al., 1994; Ayuso-Mateos et al., 1997; Himelhoch *et al*., 2011; Cournos *et al*., 1994; Klinkenberg *et al*., 1998). Further studies with large numbers to include all the psychiatric hospitals in Ghana will be necessary to draw a definitive conclusion.

Concerning the prevalence of HIV, HBV, HCV and Syphilis infections and gender, women were found to be more infected with HIV and syphilis infections representing

70.0% and 55.6% of the total infections as compared to men who were more infected with HBV and HCV recording 52.6% and 44.4% respectively. In relation to women with higher HIV and Syphilis infections, it can be explained that, women with psychiatric disorders are more likely to experience exploitation and sexual assault as well as power differential,

making them less empowered to negotiate condom use or to refuse sex (Howard *et al*., 2010). Also women are biologically more likely to acquire these infections than men. By contrast, men with psychiatric disorders are likely to be infected with Hepatitis B and C virus because injection drug use and tattooing are more common in men. With respect to age distributions across all four infectious diseases, these age groups (i.e. 20-29; 30-39) are the most prevalent in terms of HIV, HBV, HCV and syphilis infections. This result of the study is consistent with previously published studies (Hellerslein *et al*., 1992; Cary *et al*., 2001).

Concerning marital status and rate of infections, single and married participants had equal chance of HIV infections, whiles single participants were more positive to HBV and HCV infections. One explanation is that married/monogamous women may be at risk, as monogamy increases vulnerability to HIV when sexual partner is risky as same studies in Brazil and elsewhere with other populations have shown (Bastos *et al*., 2001; Gangakhedkar *et al*., 1997). Married people were more infected in terms of syphilis infections. The high prevalence of infections among psychiatric patient who are not married is consistent with already published studies (Himelhoch *et al*., 2007 Casey *et al*., 2001). An interpretation to this may due multiple sexual encounters by their partners since most of the participants (70.0%) infected with HIV were women.

With regards to educational status, participants who have the basic level of education were more infected with HIV, HBV and syphilis infections whilst participants who have had the secondary level of education were more positive to Hepatitis C virus. This can be attributed to the low level of education since the higher a participants level of education, the more knowledge a participant would acquire about these infectious diseases. Concerning employment status and the rate of infections, the unemployed were more infected with respect to HIV and HCV infections recording 70.0% and 100% respectively of all infections

as compared to participants employed who were more infected with HBV and Syphilis infections recording 63.2% and 63.0% of infections respectively. With respect to the type of psychiatric diagnosis and infection status, patients with schizophrenia disorders were more infected with all four infectious diseases recording 60.0% for HIV, 42.1% for HBV, 50.0% for HCV and 296% for Syphilis infections respectively. Bipolar disorder was found to be the second psychiatric disorder with the highest prevalence rate recording 10.0% for HIV, 21.1% for HBV and 18.5% for Syphilis infections respectively. This result is consistent with previous study which suggested that schizophrenia and bipolar disorders appears to be related to increase HIV risk by OttoSalaj & Stevenson, (2001). It is in contrast with previous studies which found no difference in HIV prevalence between persons having different psychiatric disorders

(Acuda *et al*., 2009; Henning *et al*., 2012; Collins *et al*., 2009). However in a review by McKinnon & Cournos (1997), to determine the seroprevalence of HIV among people with severe mental illness in the United States reported that psychiatric diagnosis was not consistently associated with HIV. The reasons for people with schizophrenia disorders being the most infected is that, psychiatric diagnosis were recorded from their clinical charts and were not confirmed e.g. using a structured clinical interview, also most of the patients enrolled in the study were people with schizophrenia disorders hence the more infection the acquired.

Additionally, awareness about HIV and AIDS was universal with almost all participants (94.2%) having heard of the disease as compared to HBV and HCV representing (69.1% & 39.8%) of awareness respectively. This can be attributed to the massive publication by the Ghana AIDS Commission and assistance by non-governmental organizations NGOs in creating awareness which does not commensurate with the level of awareness created for HBV, HCV and Syphilis infections. Moreover majority of the study participants have not

had blood test for these infectious diseases with HIV (63.7%), HBV (89.0%), and HCV (96.9%). Few participants (2.8%) have been vaccinated against HBV. This can be explained especially with regards to HBV, HCV and Syphilis that, there is inadequate awareness creation and also the level of education of participants which is mostly basic level. The higher participant's level of education, the more knowledge a participant would acquire about these infectious diseases.

Multivariate logistic regression was used to analyze the results to determine the risk factors influencing the acquisition and spread of HIV, HBV, HCV and Syphilis infections and found out that, for all comparisons, $P<0.05$ was considered statistically significant. Most of the subjects were reported to be having heterosexual intercourse. Behaviours such as having multiple sexual partners and casual sexual partners were reported more often by patients with psychiatric disorders. Similarly, sex whilst high on drugs or alcohol was reported at high rates putting patients at increased risk of HIV and AIDS/STIs. Additionally, majority of the patients do not use condoms during sexual intercourse and it was mostly reported by patients who were not married, with multiple partners and those who were married. Contrary to previously published studies which reported high prevalence of injection drug use among people with psychiatric disorders exceeding 25% in the United States (Rosenberg et al., 2001; Carey et al., 1997; Otto-Salaj et al., 1998; Susser et al., 1996), this study revealed high prevalence of non-injection drugs (i.e. tobacco, marijuana) and alcohol intake. One interpretation to low prevalence of may be the difference in geographical area. Needle/razor sharing was found to be in association with HIV/STIs among people with psychiatric disorders. Forced sex/sex work, paid sex and sex in exchange for food, shelter or drugs were also found to be in association with the HIV,

HBV, HCV and Syphilis infections.

After the inclusion of HBV, HCV and Syphilis in the study, it revealed that people with psychiatric disorders are at increased risk for STIs including HIV and AIDS and is consistent with studies conducted in the developed countries (Wise *et al*., 2012; Guimaraes *et al*., 2009).

These results were discussed mindful of the study strength and limitations. Strength of the study: it is an important clinical implication. Patients who took part in the study benefited from sexual health assessment, counseling and testing of HIV, HBV, HCV, and Syphilis infections. The limitation was that, not all STIs were tested (e.g. herpes, human papilloma virus, candida, trichomonas and chancroid). It is likely a higher percentage of participants would have been found to be infected with an STI.

CHAPTER 6

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

The overall seroprevalence of HIV, HBV, HCV and Syphilis infections among people with psychiatric disorders was found to be 5.0%, 9.5%, 2.0%, and 13.0% respectively. Multiple infections was also found to be 0.5% for HBV+Syphilis, 1.0% for HBV+HIV, 0.5% for HCV+Syphilis and 0.5% for HIV+HBV+Syphilis respectively. The prevalence was found to be higher in females with respect to HIV and Syphilis infections and higher in males with respect to Hepatitis B and C viral infections. This study also revealed after using multiple logistic regression that, having multiple sexual partners, trading sex for money, drug, or sex, forced sex, inconsistent condom use, substance abuse and alcohol, and sex while high on

drugs or alcohol was found to be in association with HIV, HBV, HCV and Syphilis infections.

There is universal awareness about HIV and AIDS. Almost all participants know about HIV acquisition, spread and preventive methods. However there is a big gap between HIV and other STIs (i.e. HBV, HCV and Syphilis), unlike HIV, majority of the participants have never heard of HBV, HCV and Syphilis, its mode of transmission and preventive methods. Alarmingly, only a small portion of the participants have had blood test for these infectious diseases and still very few have been vaccinated against HBV. Participant's level of education was directly linked with the in-depth of knowledge about HIV, HBV, HCV and Syphilis infections. The higher the participants level of education, the greater the likelihood of the person having knowledge about these diseases. However, there is the need for a universal education about HIV, HBV, HCV and Syphilis infections among people with psychiatric disorders.

6.2 RECOMMENDATIONS

The following recommendations are proposed to solve some of the challenges base on the outcome of the study.

- An STI center should be created at the Ankaful Psychiatric Hospital to address the needs of infected persons. For instance ARTs and vaccination.
- Knowledge and awareness gap between HIV and the other STIs (i.e. HBV, HCV and Syphilis) should be bridged through public education by government and the non-governmental organizations.
- Further studies should be conducted to include all psychiatric hospitals in Ghana to achieve a definite conclusion about people with psychiatric disorders and STIs.

REFERENCES

Adjei, A., Armah, H., Gbagbo, F., Ampofo, W., Quaye, I., Hesse, I. & Mensah, G. (2006).

Adoba P, Boadu SK, Agbodzakey H, Somuah D, Ephraim RKD, Odame EA. *High prevalence of hepatitis B and poor knowledge on hepatitis B and C viral infections among barbers in the Obuasi municipality, Ghana.* University of Cape Coast.

Akiskal, Hagop S. (2005). Mood disorders: clinical features. *Sadock BJ, Sadock VA (ed)*, 702-709.

Almeida, Regina Capanema de, & Pedroso, Enio Roberto Pietra. (2004). Vulnerabilidade e exposição a marcadores sorológicos dos vírus da imunodeficiência humana, hepatites B e C, vírus linfotrópico de células T humanas e sífilis em pacientes psiquiátricos internados em hospital público. *Rev. méd. Minas Gerais, 14*(4), 244250.

Amidu N, Alhassan A, Obirikorang C, Feglo P, Majeed SF, Timmy-Donkoh E, et al. Seroprevalence of hepatitis B surface (HBsAg) antigen in three densely populated communities in Kumasi, Ghana. J Med Biomed Sci. 2012;1(2):59–65.

Armstrong, Gregory L, Alter, Miriam J, McQuillan, Geraldine M, & Margolis, Harold S. (2000). The past incidence of hepatitis C virus infection: implications for the future burden of chronic liver disease in the United States. *Hepatology, 31*(3), 777-782.

Ayuso-Mateos, José L, Monta, F, Lastra, Ismael, de la Garza, J Picazo, & Ayuso-Guti, JL. (1997). HIV infection in psychiatric patients: an unlinked anonymous study. *The British Journal of Psychiatry, 170*(2), 181-185.

Babudieri, S., Longo, B., Sarmati, L., Starnini, G., Dori, L., Suligoi, B., & Novati, S. (2005). Correlates of HIV, HBV, and HCV infections in a prison inmate population: results from a multicentre study in Italy. *Journal of medical virology*, *76*(3), 311-317

Baillargeon, J., Binswanger, I. A., Penn, J. V., Williams, B. A., & Murray, O. J. (2009). Psychiatric disorders and repeat incarcerations: the revolving prison door. *American Journal of Psychiatry*, *166*(1), 103-109.

Bizzarri, Jacopo V, Sbrana, Alfredo, Rucci, Paola, Ravani, Laura, Massei, Guido Jacopo, Gonnelli, Chiara, . . . Endicott, Jean. (2007). The spectrum of substance abuse in bipolar disorder: reasons for use, sensation seeking and substance sensitivity. *Bipolar Disorders*, *9*(3), 213-220.

Boahemaa-Atta, P. (2014). *Prevalence of Human Immunodeficiency Virus, Syphilis, Hepatitis B, and Risk Factors Among Truck Drivers in Tema, Ghana* (Doctoral dissertation, University of Ghana).

Borges, G., Nock, M. K., Abad, J. M. H., Hwang, I., Sampson, N. A., Alonso, J., & Bromet, E. (2010). Twelve-month prevalence of and risk factors for suicide attempts in the World Health Organization World Mental Health Surveys. *The Journal of clinical psychiatry*, *71*(12), 1617-1628.

Brown, Alan S. (2011). The environment and susceptibility to schizophrenia. *Progress in neurobiology*, *93*(1), 23-58.

Burke, Pamela J, O'Sullivan, Joanne, & Vaughan, Brigid L. (2005). Adolescent substance use: brief interventions by emergency care providers. *Pediatric emergency care*, *21*(11), 770-776.

Burton, G., & Engelkirk, P. (2004). Microbiology for the Health Sciences seventh edition. Lippincott , Philadelphia

Campos, L. N,, Guimarães, M. D. C., Carmo, R. A., Melo, A. P. S., Oliveira, H. N. D, Elkington, K., & McKinnon, K. (2008). HIV, syphilis, and hepatitis B and C prevalence among patients with mental illness: a review of the literature. *Cadernos de saúde pública, 24*, s607-s620.

Carey, Michael P, Carey, Kate B, Maisto, Stephen A, Gordon, Christopher M, & Vanable, Peter A. (2001). Prevalence and correlates of sexual activity and HIV-related risk behavior among psychiatric outpatients. *Journal of consulting and clinical psychology, 69*(5), 846.

Carey, Michael P, Ravi, V, Chandra, Prabha S, Desai, Anita, & Neal, Dan J. (2007). Prevalence of HIV, Hepatitis B, syphilis, and chlamydia among adults seeking treatment for a mental disorder in southern India. *AIDS and Behavior, 11*(2), 289297.

Carey, Michael P, Weinhardt, Lance S, & Carey, Kate B. (1995). Prevalence of infection with HIV among the seriously mentally ill: Review of research and implications for practice. *Professional Psychology: Research and Practice, 26*(3), 262.

Centers for Disease Control and Prevention. (2009). HIV infection among injection-drug users-34 states, 2004-2007. *MMWR. Morbidity and mortality weekly report, 58*(46), 1291.

Centers for Disease Control. (2005). CDC HIV/AIDS Surveillance Report, 2005. *Atlanta, GA: Department of Health and Human Services, Centers for Disease Control and Prevention*.

Chandler, Redonna K, Fletcher, Bennett W, & Volkow, Nora D. (2009). Treating drug abuse and addiction in the criminal justice system: improving public health and safety. *Jama, 301*(2), 183-190.

Chopra, Gurbakhsh S, & Smith, James W. (1974). Psychotic reactions following cannabis use in East Indians. *Archives of General Psychiatry, 30*(1), 24.

Collins, C., Harshbarger, C., Sawyer, R., & Hamdallah, M. (2006). The diffusion of effective behavioral interventions project: development, implementation, and lessons learned. *AIDS Education & Prevention, 18* (supp), 5-20.

Compton, W. M, & Volkow, N. D. (2006). Abuse of prescription drugs and the risk of addiction. *Drug and alcohol dependence, 83*, S4-S7.

Costa, Geonaldo Fonseca. (1984). Mortality by neurosyphilis at a psychiatric hospital during a period of 50 years. *Arquivos de neuro-psiquiatria, 42*(1), 20-24.

Cournos, Francine, Guido, Jeannine R, Coomaraswamy, Siobhan, Meyer-Bahlburg, Heino, Sugden, Richard, & Horwath, Ewald. (1994). Sexual activity and risk of HIV infection among patients with schizophrenia. *American Journal of Psychiatry, 151*(2), 228-232.

De Souza, M.M., Barbosa, M.A. , Borges, A.M , Daher, P.R , Martins, R.M , & Cardosa, D.D (2004). Seroprevalence of hepatitis B virus infection in patients with mental problems. *RevBrasPsiquitar* 26:34-27.

Devi, KhS, Singh, Ng Brajachand, Singh, H Lokhendro, & Singh, Y Manihar. (2009). Coinfection by human immunodeficiency virus, hepatitis B virus and hepatitis C virus in injecting drug users. *Journal of the Indian Medical Association, 107*(3), 144, 146-147.

Dongdem JT, Kampo S, Soyiri IN, Asebga PN, Ziem JB, Sagoe K. Prevalence of hepatitis B virus infection among blood donors at the Tamale Teaching Hospital, Ghana (2009). BMC Res Notes. 2009;5:115.

Fattovich, Giovanna, Bortolotti, Flavia, & Donato, Francesco. (2008). Natural history of chronic hepatitis B: special emphasis on disease progression and prognostic factors. *Journal of hepatology*, *48*(2), 335-352.

Fernandez-Egea, E. , Gil, E. , Santaoma, S. , Baro, M.S. , Andreu, J.B, & Miyar, M.V. . (2002). Serological testing and prevalence of human immunodeficiency, hepatitis B and C infections amongst acute psychiatric inpatients. *Med Clin (Barc)*, 119:690-112.

Fitzpatrick, Lisa, McCray, Eugene, & Smith, Dawn K. (2004). The global HIV/AIDS epidemic and related mental health issues: The crisis for Africans and Black Americans. *Journal of Black Psychology, 30*(1), 11-23.

Freed, Earl X. (1975). Alcoholism and schizophrenia: the search for perspectives. A review. *Journal of Studies on Alcohol, 36*(7), 853-881.

Goodyer, I.M. (2002). Social adversity and mental functions in adolescents at high risk of psychopathology. *The British Journal of Psychiatry, 181*(5), 383-386.

Guimarães, Mark Drew Crosland, Oliveira, Helian Nunes de, Campos, Lorenza Nogueira, Santos, Carolina Ali, Gomes, Carlos Eduardo Resende, Oliveira, Suely Broxado de, . . . Machado, Carla Jorge. (2008). Reliability and validity of a questionnaire on vulnerability to sexually transmitted infections among adults with chronic mental illness: PESSOAS Project. *Revista Brasileira de Psiquiatria, 30*(1), 55-59.

Himelhoch, S. , MacCarthy, J. , Ganoczy, D , Medoff, D. , Dixon, L.B. , & Blow, F.C. . (2007). Understanding associations between serious mental illness and HIV among patients in the VA health system. . *PsychiatrServ.*, 58:1165-1172.

Hollister, Leo E. (1986). Health aspects of cannabis. *Pharmacological reviews, 38*(1), 1-20.

Hughes, Elizabeth, Bassi, Shaan, Gilbody, Simon, Bland, Martin, & Martin, Fabiola. (2016). Prevalence of HIV, hepatitis B, and hepatitis C in people with severe mental illness: a systematic review and meta-analysis. *The Lancet Psychiatry, 3*(1), 40-48.

Hung CC, Loh el W, Hu TM, et al. Prevalence of hepatitis B and hepatitis C in patients with chronic schizophrenia living in institutions. J Chin Med Assoc 2012; 75: 275–80.

Kalichman, Seth C, Kelly, Jeffrey A, Johnson, Jennifer R, & Bulto, Marita. (1994). Factors associated with risk for HIV infection among chronic mentally ill adults. *American Journal of Psychiatry, 151*(2), 221-227.

Kao, Jia-Horng, & Chen, Ding-Shinn. (2002). Global control of hepatitis B virus infection. *The Lancet infectious diseases, 2*(7), 395-403.

Kärner, Martin, Filimonova, Galina, & Jaks, Viljar. (2000). Dynamic of liver cell population in biopsies of patients with chronic hepatitis B.

Karon, John M, Rosenberg, Philip S, McQuillan, Geraldine, Khare, Meena, Gwinn, Marta, & Petersen, Lyle R. (1996). Prevalence of HIV infection in the United States, 1984 to 1992. *Jama, 276*(2), 126-131.

Kelly, BD, O'Callaghan, E, Lane, A, & Larkin, C. (2003). Schizophrenia: solving the puzzle. *Irish journal of medical science, 172*(1), 37-40.

Kessler, Ronald C, Berglund, Patricia, Demler, Olga, Jin, Robert, Merikangas, Kathleen R, & Walters, Ellen E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of general psychiatry, 62*(6), 593-602.

Klinkenberg, W. , Caslyn, R. , Morse, G. , Yonker, R.D , McCudden, S. , & Ketema, F. (2003). Prevalence of human immunodeficiency virus, hepatitis B and C among homeless persons with co-occurring severe mental illness and substance use disorders. *Compr Psychiatry* 44:293-302.

Knudsen, Peder, & Vilmar, T. (1984). Cannabis and neuroleptic agents in schizophrenia. *Acta Psychiatrica Scandinavica, 69*(2), 162-174.

Krishnan, K Ranga Rama. (2005). Psychiatric and medical comorbidities of bipolar disorder. *Psychosomatic medicine, 67*(1), 1-8.

Kyei, George B, Dinkins, Christina, Davis, Alexander S, Roberts, Esteban, Singh, Sudha B, Dong, Chunsheng, . . . Yamamoto, Akitsugu. (2009). Autophagy pathway intersects with HIV-1 biosynthesis and regulates viral yields in macrophages. *The Journal of cell biology, 186*(2), 255-268.

L. (2007). Community-level HIV prevention for persons with severe mental illness living in supportive housing programs: A pilot intervention study. *Journal of prevention & intervention in the community, 33*(1-2), 121-135.

Lagios, PB. (2012). *The risk of sexually transmitted infecions and bloood borne viruses for patients with severe mental illness*. University of Wollongong.

Lankenau, Stephen E, Clatts, Michael C, Welle, Dorinda, Goldsamt, Lloyd A, & Gwadz, Marya Viost. (2005). Street careers: Homelessness, drug use, and sex work among young men who have sex with men (YMSM). *International Journal of Drug Policy, 16*(1), 10-18.

Lavanchy, Daniel. (2004). Hepatitis B virus epidemiology, disease burden, treatment, and current and emerging prevention and control measures. *Journal of viral hepatitis, 11*(2), 97-107.

Lohiya, S. , Ghanshyam, L. , & Caires, S. . (1986). Epidemiology of hepatitis B infection in institutionalized mentally retarded clients. *Am J Public Health* 76: 799-802.

Lundberg, P., Nakasujja, N., Musisi, S., Thorson, A. E., Cantor-Graae, E., & Allebeck, P.(2013). HIV prevalence in persons with severe mental illness in Uganda: a crosssectional hospital-based study. *International journal of mental health systems, 7*(1), 1.

Maj, Mario, Satz, Paul, Janssen, Robert, Zaudig, Michael, Starace, Fabrizio, D'Elia, Lou,

Ndetei, David. (1994). WHO Neuropsychiatric AIDS Study, cross-sectional phase II: neuropsychological and neurological findings. *Archives of General Psychiatry*, *51*(1), 51-61.

Malanda, S, Meadows, J, & Catalan, J. (2001). Are we meeting the psychological needs of Black African HIV-positive individuals in London? Controlled study of referrals to a psychological medicine unit. *AIDS care*, *13*(4), 413-419.

Maling, Samuel, Todd, Jim, Van der Paal, Lieve, Grosskurth, Heiner, & Kinyanda, Eugene. (2011). HIV-1 seroprevalence and risk factors for HIV infection among first-time psychiatric admissions in Uganda. *AIDS care*, *23*(2), 171-178.

Marks, G., Crepaz, N., Senterfitt, J. W., & Janssen, R. S. (2005). Meta-analysis of highrisk sexual behavior in persons aware and unaware they are infected with HIV in the United States: implications for HIV prevention programs. *JAIDS Journal of Acquired Immune Deficiency Syndromes*, *39*(4), 446-453.

Mashaphu, S, & Mkize, DL. (2015). HIV seropositivity in patients with first-episode psychosis. *South African Journal of Psychiatry*, *13*(3), 4.

Mathers, Colin, Fat, Doris Ma, & Boerma, Jan Ties. (2008). *The global burden of disease: 2004 update*: World Health Organization.

McCurdy, SA, Williams, ML, Kilonzo, GP, Ross, MW, & Leshabari, MT. (2005). Heroin and HIV risk in Dar es Salaam, Tanzania: youth hangouts, mageto and injecting practices. *AIDS care*, *17*(S1), 65-76.

McKinnon, Karen, & Cournos, Francine. (1998). HIV infection linked to substance use among hospitalized patients with severe mental illness. *Psychiatric Services*, *49*(10).

Meade, C. S., & Sikkema, K. J.(2005). HIV risk behavior among adults with severe mental illness: a systematic review. *Clinical psychology review*, *25*(4), 433-457

Meade, Christina S, & Sikkema, Kathleen J. (2005). Voluntary HIV testing among adults with severe mental illness: frequency and associated factors. *AIDS and Behavior, 9*(4), 465-473.

Medical Microbiology, 55 (Pt 5). 593-597.

Mishara, William Langa, & Gbaden, Esther Anenge. (2014). The Prevalence of Depression among the Youths as an Aftermath of the Internal Insurgency Attacks in Maiduguri, Nigeria. Journal of Humanities and social sciences, 19, 32-35.

Monteiro, Carlos Augusto, Cavalcante, Tania Maria, Moura, Erly Catarina, Claro, Rafael Moreira, & Szwarcwald, Célia Landmann. (2007). Population-based evidence of a strong decline in the prevalence of smokers in Brazil (1989-2003). *Bulletin of the World Health Organization, 85*(7), 527-534.

Mott, Richard H, SMALL, IVER F, & ANDERSON, JOHN M. (1965). Comparative study of hallucinations. *Archives of General Psychiatry, 12*(6), 595-601.

Mueser, Kim T, Goodman, Lisa B, Trumbetta, Susan L, Rosenberg, Stanley D, Osher, Fred C, Vidaver, Robert, . . . Foy, David W. (1998). Trauma and posttraumatic stress disorder in severe mental illness. *Journal of consulting and clinical psychology, 66*(3), 493.

National Center for Health Statistics. (2009). NHANES 1999–2000 prescription medication questionnaire file documentation.

Nyandindi, Cassian L. (2011). *HIV Serostatus, Hepatitis C and Depression Among Injection Drug Users in Kinondoni Municipality, Dar es Salaam, Tanzania (*Muhimbili University of Health and Allied Sciences)

Olley, B.O, & Bolajoko, A. J. (2008). Psychosocial determinants of HIV-related quality of life among HIV-positive military in Nigeria. *International journal of STD & AIDS, 19*(2), 94-98.

Omoregie, R, Omokaro, EU, Palmer, O, Ogefere, HO, Egbeobauwaye, A, Adegue, JE, . . . Ihemeje, V. (2009). Prevalence of anaemia among HIV-infected patients in Benin City, Nigeria. *Tanzania Journal of Health Research, 11*(1).

Prevalence of Human immunodeficiency virus, Hepatitis B virus, Hepatitis C virus and

Rahman, Atif, Patel, Vikram, Maselko, Joanna, & Kirkwood, Betty. (2008). The neglected 'm'in MCH programmes–why mental health of mothers is important for child nutrition. *Tropical Medicine & International Health, 13*(4), 579-583.

Rosenberg, Stanley D, Goodman, Lisa A, Osher, Fred C, Swartz, Marvin S, Essock, Susan M, Butterfield, Marian I, . . . Salyers, Michelle P. (2001). Prevalence of HIV, hepatitis B, and hepatitis C in people with severe mental illness. *American journal of public health, 91*(1), 31.

Schneck, Christopher D, Miklowitz, David J, Miyahara, Sachiko, Araga, Mako, Wisniewski, Stephen, Gyulai, Laszlo, . . . Sachs, Gary S. (2008). The prospective course of rapid-cycling bipolar disorder: findings from the STEP-BD. *American Journal of Psychiatry*.

Schuckit, MA. (1989). Drug and Alcohol Abuse (3rd cd.): New York, NY: Plenum.

Scott, D., & Happell, B. (2011). The high prevalence of poor physical health and unhealthy lifestyle behaviours in individuals with severe mental illness. *Issues in mental health nursing, 32*(9), 589-597.

Sikkema, K. J., Meade, C. S., Doughty-Berry, J. D., Zimmerman, S. O., Kloos, B., & Snow, D.

Stout, Robert L, Fulks, Michael, & Dolan, Vera F. (2012). Trends in mortality of insurance applicants with HIV infection. *J Insur Med, 43*(2), 67-75.

Strakowski, Stephen M, Sax, Kenji W, McElroy, Susan L, Keck, Paul E, & West, Scott A. (1998). Course of psychiatric and substance abuse syndromes co-occurring with

bipolar disorder after a first psychiatric hospitalization. *The Journal of clinical psychiatry, 59*(9), 1,478-471.

Syphilis among prison inmates and officers at Nsawam and Accra, Ghana. *Journal of*

Tabibia, J.H, Wirshing, D.A , Pierre, J.M. , Guzik, L.H , Kiski, M.D , & Danovich, I (2008). Hepatitis Band C among veterans on a psychiatric ward. *Dig Dis Sci* 53:1693-1698.

Unodc, HIV. (2007). prisons in sub-Saharan Africa: Opportunities for action. *United Nations Office on Drugs and Crime, Vienna*.

Van-Ess, P.B. (2013). *HIV Related Risk Behaviours Among Male Prisoners in Selected Prisons in Ghana.* University of Ghana (Doctoral dissertation, University of Ghana).

Victor, Maurice, & Hope, Justin M. (1958). THE PHENOMENON OF AUDITORY HALLUCINATIONS IN CHRONIC ALCOHOLISM: A CRITICAL EVALUATION OF THE STATUS OF ALCOHOLIC HALLUCINOSIS. *The Journal of nervous and mental disease, 126*(5), 451-481.

Walkup, James, McAlpine, Donna D, Olfson, Mark, Boyer, Carol, & Hansell, Steve. (2000). Recent HIV testing among general hospital in patients with schizophrenia: findings from four New York City sites. *Psychiatric Quarterly, 71*(2), 177-193.

Wodak, Alex, & McLeod, Leah. (2008). The role of harm reduction in controlling HIV among injecting drug users. *AIDS (London, England), 22*(Suppl 2), S81.

World Health Organization. (2001). Global prevalence and incidence of selected curable sexually transmitted infections: overview and estimates.

World Health Organization. (2002). hepatitis B.

World Health Organization. (2004). *International statistical classification of diseases and related health problems* (Vol. 1): World Health Organization.

World Health Organization. (2007). *AIDS epidemic update, December 2006*: World Health Organization.

World Health Organization. (2011). Maternal, child and adolescent mental health: Challenges and strategic directions for the Eastern Mediterranean Region.

APPENDIX A

QUESTIONNAIRE ON HIV, HBV, HCV AND PSYCHIATRIC DISORDERS

Code: APH ……

Date: ☐☐ / ☐☐ / ☐☐☐ Gender: | M | F |

SECTION 1:

BACKGROUND CHARACTERISTICS: (NB) this exercise would be treated confidentially.

101. Age: ……

102. Nationality: Ghanaian

others specify ……

103. Marital status: Single ☐ Married ☐ Divorced ☐ Widowed ☐

104. If married, how many children do you have? 1 ☐ 2 ☐ ☐

3 ☐ 4 5

105. Level of education: Primary ☐ Secondary ☐ Tertiary ☐ None ☐

106. Religion: Christian ☐ Islam ☐ African Tradition Others ☐

107. Were you employed before been admitted or diagnosed with psychiatric disorders?

YES ☐ NO ☐

SECTION 2:

PSYCHIATRIC DIAGNOSIS: these answers would be provided from participants record books.

201. What is the type of psychiatric disorder diagnosed? .....

202. Other diagnoses? ……..

203. In which year were you first diagnosed? .....

204. Date of admission? .....

205. Type of medications administered? .....

SECTION 3:

SEXUALL LIFESTYLES:

301: What is your sexual orientation? Homosexual ☐ Heterosexual ☐ Bisexual ☐

302: In your whole life, how many women have you had sex with? .....

303: In your whole life, how many men have you had sex with? .....

304: Do you currently have a regular sexual partner(s)? YES NO

SECTION 4:

HIV/AIDS, HBV, HCV KNOWLEDGE AND VACCINATION

401: Have you ever heard of HIV/AIDS? YES NO

402: Have you ever heard of HBV? YES NO

403: Have you ever heard of HCV? YES NO

404: What was your source of information? Radio Newspaper/magazine

Friend Family member Television

405: How can a person contract these viruses? Through heterosexual intercourse

Through anal intercourse

During pregnancy

Sharing of toothbrushes and razors

Blood transfusion

406: Have you ever had a blood test for HIV? YES NO

407: Have you ever had a blood test for HBV? YES NO

408: Have you ever had a blood test for HCV? YES NO

409: Have you been vaccinated against HBV? YES NO

410: Have you ever heard of Antiretroviral drugs (ART) for HIV/AIDS? YES NO

411: Can ARTs cure HIV/AIDS? YES NO

SECTION 5:

SUBSTANCE USE BEHAVIOR

501: Do you smoke cigarettes, cigars, or any other tobacco products?

502: How long have you been smoking? …….

503: How often do you have an alcoholic drink of any kind? .....

504: Have you ever injected (self-injected) any drugs, apart from prescribed drugs?

YES NO

505: Have you ever used marijuana? YES NO

506: Have you ever used heroin? YES NO

507: Have you ever used a needle after someone else had already used it? YES NO

508: Have you ever used any other drugs? YES ☐ NO ☐

If YES specify……..

509: Have ever had sex with a partner whilst they were high on drugs or alcohol?

YES ☐ NO ☐

510: Have you ever had sex with a partner whilst you were high on drugs or alcohol?

YES ☐ NO ☐

511: Have you ever had sex with a partner that had a drug or alcohol problem?

YES ☐ NO ☐

SECTION 6:

FORCED SEX /SEX WORK

601: Have you ever been forced or frightened by a man or a woman into doing something sexually that you didn't want to do? YES ☐ NO ☐

602: How many times has this happened? .....

603: How old were you when it started? .....

604: Have you ever been paid money or paid for sex before? YES ☐ NO ☐

605: Have you ever been given food, shelter or drugs in return for sex? YES ☐ NO ☐

606: In all these, did you ever use condoms? YES ☐ NO ☐

THANK YOU!!!

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF MEDICAL SCIENCES / KOMFO ANOKYE TEACHING HOSPITAL
COMMITTEE ON HUMAN RESEARCH, PUBLICATION AND ETHICS

Our Ref: CHRPE/AP/030/16

2nd February, 2016.

Mr. Benedict Osei Tawiah
Ghana Prisons Service
Post Office Box 125
ANKAFUL-CAPE COAST.

Dear Sir,

LETTER OF APPROVAL

Protocol Title:	*"Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), and Hepatitis Virus (HCV) among People with Psychotic Disorders: A Cross Sectional Study of the Ankaful Psychiatric Hospital."*
Proposed Site:	*Ankaful Psychiatric Hospital (Laboratory), Cape Coast.*
Sponsor:	*Principal Investigator.*

Your submission to the Committee on Human Research, Publications and Ethics on the above named protocol refers.

The Committee reviewed the following documents:

- A notification letter of 24th June, 2015 from the Ankaful Psychiatric Hospital (study site) indicating approval for the conduct of the study in the Hospital
- A Completed CHRPE Application Form.
- Participant Information Leaflet and Consent Form.
- Research Protocol.
- Questionnaire.

The Committee has considered the ethical merit of your submission and approved the protocol. The approval is for a fixed period of one year, renewable annually thereafter. The Committee may however, suspend or withdraw ethical approval at anytime if your study is found to contravene the approved protocol.

Data gathered for the study should be used for the approved purposes only. Permission should be sought from the Committee if any amendment to the protocol or use, other than submitted, is made of your research data.

The Committee should be notified of the actual start date of the project and would expect a report on your study, annually or at the close of the project, whichever one comes first. It should also be informed of any publication arising from the study.

Yours faithfully,

Osomfuor Prof. Sir J. W. Acheampong MD, FWACP
Chairman

Room 7 Block J, School of Medical Sciences, KNUST, University Post Office, Kumasi, Ghana
Phone: +233 3220 63248 Mobile: +233 20 5453785 Email: chrpe.knust.kath@gmail.com / chrpe@knust.edu.gh

APPENDIX C

CONSENT FORM

Statement of person obtaining informed consent:
I have fully explained this research to _____ and have given sufficient information about the study, including that on procedures, risks and benefits, to enable the prospective participant make an informed decision to or not to participate.

DATE: _____ NAME: _____

Statement of person giving consent:
I have read the information on this study/research or have had it translated into a language I understand. I have also talked it over with the interviewer to my satisfaction.

I understand that my participation is voluntary (not compulsory).

I know enough about the purpose, methods, risks and benefits of the research study to decide that I want to take part in it.

I understand that I may freely stop being part of this study at any time without having to explain myself.

I have received a copy of this information leaflet and consent form to keep for myself.

NAME:_____

DATE: _____ SIGNATURE/THUMB PRINT: _____

Statement of person witnessing consent (Process for Non-Literate Participants):

I _____ (Name of Witness) certify that information given to

_____ (Name of Participant), in the local language, is a true reflection of what l have read from the study Participant Information Leaflet, attached.

WITNESS' SIGNATURE (maintain if participant is non-literate): _____

MOTHER'S SIGNATURE (maintain if participant is under 18 years): _____

MOTHER'S NAME: _____

FATHER'S SIGNATURE (maintain if participant is under 18 years): _____

FATHER'S NAME: _____