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**CLINICAL STAGES OF HIV INFECTION AMONG FIRST ADULT
ATTENDANTS AT ART CLINIC IN EASTERN REGIONAL HOSPITAL-**



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DECLARATION

I hereby declare that apart from specific references which have duly been acknowledged, this dissertation is my own work put together.

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DEDICATION

To Madam Margaret Adjoa Agyeiwaa who has inspired me through my academia. To my husband and my siblings. God richly bless you all.



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I give thanks to Almighty God through our Lord Jesus Christ for life and strength to finish this work.

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ABSTRACT

HIV/AIDS continue to affect millions of people especially in Sub-Saharan Africa.

In the developed countries 10-30% of people infected present late for care while in developing countries 40-63% of people infected with the disease present late for clinical care. Late presentation classified as WHO stage 3 or 4 of infection is associated with increased morbidity and mortality and presents the opportunity of onward transmission of the infection.

Antiretroviral therapy ART initiated at an appropriate time during HIV infection prolongs life, reduces the risk of onward transmission and greatly decreases the cost of healthcare.

WHO clinical stages of infection remains the main tool used in resource poor setting in deciding when to initiate ART.

Eastern region remains one of the regions in Ghana with a high prevalence (3.6% from 2011 HIV sentinel survey) of HIV/AIDS infection and with an ART clinic providing comprehensive care to people living with HIV/AIDS. The proportion of patients presenting late for clinical care is unknown and factors associated with late presentation has not been described over the years since clinics caring only for individuals with the infection started in the year 2005.

The aim of this study was to determine the stages of HIV infection among first adult attendants at antiretroviral therapy clinic in Eastern Regional Hospital, Koforidua from 2008 to 2012.

Findings from this study show that from 2008 to 2012 there was a rise in first attendees diagnosed at WHO stage 1 of HIV infection while those diagnosed at WHO stage 4 of infection showed a downward trend. Between 2011 and 2012 36.5% presented late for care with WHO stage 3 or 4 of HIV infection, factors associated with late presentation were being male, people who make out of pocket healthcare expenses, alcohol use, lack of a partner, being far from the clinic and poor attention to one's own health as shown by the lack of condom use

HIV intervention programs should seek to address these factors in order to reduce the burden of late presentation.

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LIST OF ABBREVIATIONS

AIDS.....Acquired Immune Deficiency Syndrome

ART.....Antiretroviral Therapy

CD4.....Cluster of Differentiation Four

HIV.....Human Immune Deficiency Virus

PMTCT.....Prevention of Mother to Child Transmission

UN.....United Nations

VCT.....Voluntary Counselling and Testing

WHO.....World Health Organization

CHAPTER ONE

1.0 INTRODUCTION

This includes the background, problem statement, conceptual framework, justification, research questions and objectives of this study.

1.1 Background

The global burden of HIV infection is mainly borne by sub-Saharan Africa. In 2012 it was estimated that about 23.5 million people in sub-Saharan Africa are living with HIV infection. This represents about 69% of the global burden of HIV AIDS (UNAIDS facts sheet 2012). In Ghana it is estimated that about 221,884 people were living with HIV infection as at 2011(UNAIDS facts sheet 2012).

Since 2001, WHO has been promoting the public health approach to antiretroviral therapy which is: making ART free and accessible in resource poor settings globally. Furthermore, studies show that this approach proposed by WHO has been implemented in most developing countries (ART-LINC Collaboration of International Databases to Evaluate AIDS (IeDEA) et al., 2008). In Ghana and most sub-Saharan African countries, there is increasing access to free antiretroviral therapy in most health facilities. Antiretroviral therapy has prolonged and improved the lives of people living with HIV AIDS (Morgan et al., 2002). The success of antiretroviral therapy depends on the timely entry into clinical care.

Early presentation and initiation of highly active antiretroviral therapy is associated with reduced morbidity and mortality in individuals with HIV infection as well as decreasing the opportunity of onward transmission of the infection. Early presentation is classified as WHO stage 1 or 2 of infection.

Late presentation classified as WHO stage 3 or 4 of infection is associated with increased morbidity and mortality even after initiation of highly active antiretroviral therapy (Sabin et al., 2006; Tuboi et al., 2009). It also increases the risk of transmission of HIV infection to others.

Studies have shown that individuals who present late for care: have increased morbidity and mortality as well as increased health care cost as compared to individuals who initiate care early (Krentz et al., 2004).

The Eastern Regional Hospital ART centre provides comprehensive care to people infected with HIV/AIDS. Currently there are over 20 ART centres in the Eastern Region and the Regional Hospital ART sees the greatest number of patients receiving care. The facility sees about 500 adult first attendants yearly.

This study seeks to quantify the burden of late presentation and to determine factors associated with late presentation in the Eastern Regional ART centre in Koforidua.

1.2 Problem Statement

In developed countries; where there is adequate financing and resources in the area of ART care, it is estimated that 10-30% of patients with HIV infection present late for clinical care (Battegay et al., 2008).

A study in Uganda puts the prevalence of late presentation at 40% using the WHO staging (Kigozi et al., 2009) while another study in Uganda using CD4 count levels gave the prevalence of late presentation as 47.6% (Wanyenze et al., 2011). A recent study in Malawi using the WHO staging also showed about 43% of patients presented late (Parrott et al., 2011).

Factors associated with late presentation in developed countries include older age, sex, risky behaviours such as injection drug use, alcohol use, low income and low level of education. Factors associated with late presentation in the Ugandan and Malawian studies included being male sex, older age, lower educational level, unemployment, being unmarried and lack of spousal HIV disclosure.

In recent times, advanced HIV infection is not commonly seen by health professionals in most developed countries however in most developing countries, advanced stages of HIV infection is a common occurrence in most health facilities and perhaps even more individuals with HIV infection die without ever seeking care in a health facility.

In Ghana studies on late presentation of HIV/AIDS and factors accounting for it is a neglected area. Between 2011 and 2012 a total of 933 clients were registered with the ART clinic for the first time in Eastern regional hospital, the proportion of late

presentation is unknown and the factors associated with late presentation is also not known, this study seeks to address these issues.

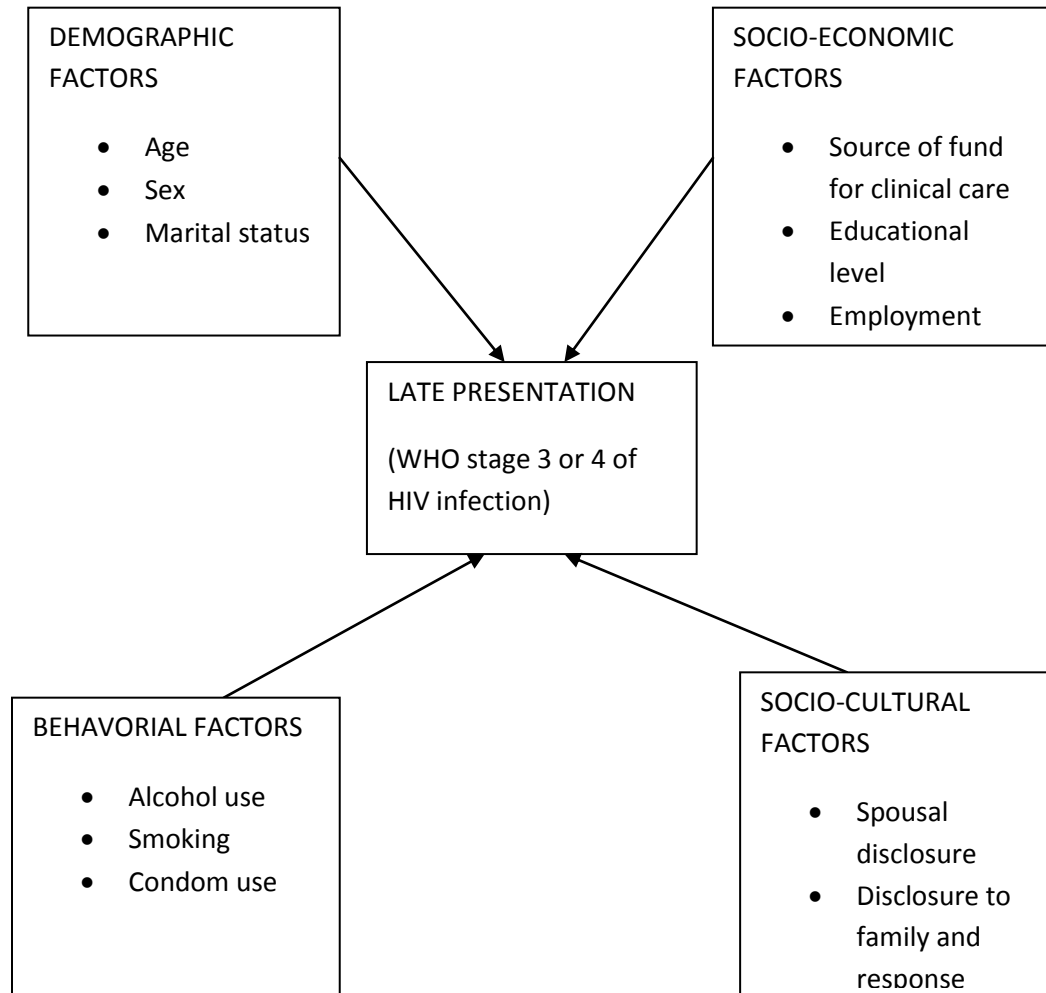
1.3 Conceptual framework: factors affecting late presentation for HIV/AIDS clinical care

Demographic factors such as older age and male sex are associated with late presentation for clinical care. Older people may have been infected longer ago and may have suspended their clinical care due to lack of treatment options. Women also utilize health facilities especially when pregnant this may explain why women present earlier for care as compared to men.

In developing countries majority of people are poor, not having a health insurance and not having funds to pay for healthcare will delay seeking healthcare resulting in an individual presenting late for care.

Inability of an individual to disclose his/her HIV status to a spouse or other family relations can make an individual delay seeking health care resulting in the individual presenting late for care.

Also individuals who abuse alcohol and smoke are likely to be involved in other risky behaviour that can make them more susceptible to being infected with HIV/AIDS, such individuals also delay in seeking healthcare when ill and are more likely to present late for care.

Figure 1: Factors associated with late presentation for HIV/AIDS clinical care

1.4 Justification

Quantifying the proportion of HIV positive patients at various clinical stages of HIV infection and showing the trends in stages of presentation among adults who are first attendants at the ART centre over the years can establish the burden of late presentation at this HIV/AIDS centre, this can enable us to see the effects of interventions by the country's HIV/AIDS programmes where focussed care on this disease is concerned.

Determining the factors associated with late presentation in the Eastern region can assist in allocating resources and designing timely interventions to overcome the barriers to early presentation in order to improve healthcare delivery for our clients.

A look back at this type of clinical care provided for HIV clients at Eastern Regional Hospital ART with success achieved can be useful in the management of other chronic diseases.

1.5 Research Questions

1. Between 2008 and 2012, what proportions of first attendees were diagnosed at the various clinical stages of HIV infection?
2. What are the trends in WHO clinical stages of HIV infection among first attendees between 2008 and 2012?
3. Among first attendees in 2011 and 2012 who presented in stage 3 or 4 HIV infection, what are the factors associated with late presentation?

1.6 Objectives

1.6a Main objective

The aim of this study is to determine the stages of HIV infection among first adult attendants at antiretroviral therapy clinic in eastern regional hospital.

1.6b Specific objectives

1. To determine the proportion of first attendees diagnosed as WHO stage 1, 2, 3 and 4 between 2008 and 2012.
2. To determine trends in WHO stages of HIV infection among first attendees between 2008 and 2012.
3. To determine factors associated with late presentation (WHO stage 3 and 4) among first attendees between 2011 and 2012.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 HIV Burden

Human immunodeficiency virus causes acquired immune deficiency syndrome; a disease of public health importance that affects people globally with its highest impact felt in sub-Saharan Africa.

According to WHO since the beginning of the HIV epidemic, almost 70 million people have been infected with the HIV virus and about 35 million people have died of AIDS. Globally, 34.0 million [31.4–35.9 million] people were living with HIV at the end of 2011. As at 2011 an estimated 0.8% of adults aged 15-49 years worldwide are living with HIV (UN fact sheet 2011).

Sub-Saharan Africa remains severely affected, with nearly 1 in every 20 adults (4.9%) living with HIV and accounting for 69% of the people living with HIV worldwide (WHO factsheet, 2011). A study reviewing literature published on the magnitude of the burden of late presentation in Sub-Sahara Africa from 2005 to 2011 showed that most individuals with HIV infection initiate care at very low CD4 counts, it also showed that although CD4 counts at initiation of care is increasing, it still remains low (Lahuerta et al., 2013). Several other studies also show that many patients initiate HIV care at low CD4 counts in Sub-Sahara Africa (Calmy et al., 2006).

In Uganda, a cross-sectional study of patient initiating care for HIV infection in a teaching hospital showed that over 40% of patients presented with WHO stage 3 or 4 of HIV infection on initial visit to ART (Kigozi et al., 2009). Another study in Uganda conducted in a hospital reported that 47.6% of patients who were newly diagnosed with HIV infection had CD4 counts ≤ 250 cells/mm described as late presentation for HIV care (Wanyenze et al., 2011).

A study in Mozambique reviewing clinical records from 2005 to 2009 of adults initiating HIV care showed that the proportion presenting late for care decreased from 46% to 37% during 2005 to 2007 but remained constant between 37% and 33% from 2007 to 2009 (Lahuerta et al., 2012).

In Ghana the disease is considered an epidemic with about 221,884 people living with HIV infection as at 2011(2011 UNAIDS report Ghana). According to the annual HIV sentinel surveys conducted among antenatal attendants, the HIV prevalence in the country seemed to be on a downward trend from 3.6% in 2003, to 2.7% in 2005, increasing to 3.2% in 2006, reducing to 2.2% in 2008 and then increasing to 2.9% in 2009. The HIV prevalence from the sentinel survey was 2.0% and 2.1% in 2010 and 2011 respectively.

The Eastern region of Ghana has one of highest prevalence of the infection since the beginning of the epidemic in Ghana. In 2011 it was one of the five regions in Ghana recording an increase in HIV prevalence, from 3.4% in 2010 to 3.6 in 2011 according to the national HIV sentinel survey.

2.2 Mode of transmission, signs and symptoms

Although the HIV virus can be isolated from a wide range of body fluids and tissues, majority of infections are transmitted by semen, cervical secretions and blood. The main routes of transmission being sexual intercourse, mother to child transmission and transmission through contaminated blood, blood products, organ donations as well as contaminated needles. Infection with HIV leads to dysfunction of the immune system leading to various clinical conditions (Clark & Kumar, 2003).

The signs and symptoms of HIV/AIDS vary, depending on the phase of infection. There are four main phases: primary infection, clinical latent infection, early symptomatic HIV infection and progression to AIDS.

2.3 Primary infection

This refers to events surrounding acquisition of HIV infection. It is associated with non-specific clinical syndromes that occur two to four weeks after exposure in 40% to 90% of individuals acquiring HIV infection (Md & Md, 2004).

HIV infection in many people begins with a flu-like illness within a month or two after the virus enters the body. This illness, known as primary or acute HIV infection, may last for a few weeks. Common signs and symptoms at this stage of HIV infection include fever, muscle soreness, rash, headache, sore throat, mouth or genital ulcers, swollen lymph glands, joint pain, night sweats and diarrhea. Although the symptoms of primary HIV infection may be mild enough to go unnoticed, the amount of virus in the blood

stream (viral load) is particularly high at this time. As a result, HIV infection spreads more efficiently during primary infection than during the next stage of infection (Clark & Kumar, 2003).

2.4 Clinical latent infection

In some people, persistent swelling of lymph nodes occurs during clinical latent HIV. Otherwise, there are no specific signs and symptoms. HIV remains in the body infecting white blood cells. Clinical latent infection typically lasts eight to ten years. A few people stay in this stage even longer, but others progress to more-severe disease much sooner.

2.5 Early symptomatic HIV infection

As the virus continues to multiply and destroy immune cells; individuals develop mild infections or chronic symptoms such as: fever, fatigue, swollen lymph nodes, diarrhoea, weight loss, Cough and shortness of breath (Clark & Kumar, 2003).

2.6 Progression to AIDS

Without treatment, the disease typically progresses to AIDS in about 10 years. By the time AIDS develops, the immune system has been severely damaged, making individual susceptible to opportunistic infections — diseases that would not trouble a person with a

healthy immune system. The signs and symptoms of some of these infections may include: soaking night sweats, shaking chills or fever higher than 100 F (38 C) for several weeks, cough and shortness of breath, chronic diarrhoea, persistent white spots or unusual lesions on the tongue or mouth, headaches, persistent unexplained fatigue, blurred and distorted vision, weight loss and skin rashes (Clark & Kumar 2003).

2.7 Testing, treatment and management of HIV infection

Various laboratory methods are available to screen blood, diagnose infection, and monitor disease progression in individuals infected by HIV. These tests can be classified into those that: (a) detect antibody, (b) identify antigen, (c) detect or monitor viral nucleic acids and (d) estimate T lymphocyte numbers. The window period ranging from six to twelve weeks is the period between infection with virus and production of antibodies. During this period the presence of the virus itself or its antigen can be detected by PCR test. Rapid Tests used in Ghana detects the presence of HIV antibodies (WHO factsheets, 2011).

HIV destroys CD4 cell which are cells of the immune system fighting infections and cancerous cells. The more CD4 cells are destroyed by the virus, the weaker the immune system becomes. CD4 cell count is an indicator of the state of the immune system in individuals infected with the HIV virus. Above 500 CD4 cell count, there is pretty normal immune function with low risk for opportunistic infections. Below 200 CD4 cell count, an individual is prone to opportunistic illnesses. CD4 levels for putting eligible persons

on ART in Ghana currently are 350 cells and below. From the 2010 national treatment guideline for HIV/AIDS in Ghana a person is also started on ART irrespective of the CD4 count levels if pregnant, has tuberculosis infection or if infected with hepatitis B infection.

There are currently three main groups of ARV drugs in use in Ghana: nucleoside reverse transcriptase inhibitors (NRTIs), non nucleoside Reverse transcriptase inhibitors (NNRTIs) and protease inhibitors (PI). Three drug combinations are used in combinations as follows: NNRTIs based regimen where 2 NRTIs and 1 NNRTI are used as first line drugs and PI-Based regimen where 2 NRTIs and 1 PI are used as second line drugs.

2.8 HIV prevention programmes

The Ghana AIDS Commission is the coordinating body for all HIV/AIDS-related activities in the country; it oversees an expanded response to the epidemic and is responsible for carrying out the National Strategic Framework on HIV/AIDS for the 2001–2005 periods. The Ghana AIDS Commission is currently reviewing the National Strategic Framework II, covering 2006–2010, with stakeholders, and bilateral and multilateral partners. The framework sets targets for reducing new HIV infections, address service delivery issues, individual and societal vulnerability as well as promote the establishment of a multisectoral, multidisciplinary approach to HIV/AIDS programs.

Ghana's goal is to prevent new HIV infections as well as to mitigate the socioeconomic and psychological effects of HIV/AIDS on individuals, communities, and the nation. The first national strategic plan focused on five themes: prevention of new infections; care and support for people living with HIV/AIDS; creation of an enabling environment for a national response; decentralization of implementation of HIV/AIDS activities through institutional arrangements; research; and monitoring and evaluation of programs. The second national strategic plan, currently in process, focuses on: policy, advocacy and enabling environment; coordination and management of the decentralized response; mitigating the economic, socio-cultural, and legal impacts; prevention, treatment, care, and support; research and surveillance as well as monitoring and evaluation.

2.9 WHO clinical staging system

The WHO clinical staging system for HIV/AIDS was developed in 1990 and in subsequent years has been revised. It emphasizes on the use of clinical parameters to guide clinical decision making for the management of HIV/AIDS patients. It was mainly designed for use in resource limited settings where there was limited access to laboratory services (Gilks et al., 2006). The WHO clinical staging system has been widely used in resource-limited countries, particularly in the African Region, and has proved pragmatic and useful in facilities at both the first level and the referral level. In Ghana it used at the primary, secondary and tertiary level in the management of HIV/AIDS.

The WHO clinical staging system gives a good estimate of the degree of immune deficiency in individuals infected with HIV/AIDS. It can be used where HIV infection is

confirmed by HIV antibody testing. The WHO staging system is widely used by healthcare providers for assessment at baseline or entry into HIV care to guide decisions on when to start cotrimoxazole prophylaxis, start ART and other HIV related interventions.

There are four main stages; clinical signs and symptoms of clinical stage 1 and 2 are usually associated with less severe immune deficiency while clinical stages 3 and 4 are associated with severe immune deficiency.

Clinical signs and symptoms of stage 1 in adults include an asymptomatic individual or an individual with persistent generalized lymphadenopathy.

Clinical signs and symptoms of stage 2 in adults include; moderate unexplained weight loss (<10% of presumed or measured body weight), recurrent respiratory tract infections (RTIs, sinusitis, bronchitis, otitis media, pharyngitis), Herpes zoster, Angular cheilitis, Recurrent oral ulcerations, Papular pruritic eruptions, Seborrhoeic dermatitis, Fungal nail infections of fingers.

Clinical signs and symptoms of stage 3 include; severe weight loss (>10% of presumed or measured body weight), unexplained chronic diarrhoea for longer than one month, unexplained persistent fever (intermittent or constant for longer than one month), persistent oral candidiasis, Oral hairy leukoplakia, Pulmonary tuberculosis, severe presumed bacterial infections such as Pneumonia, Empyema, Meningitis, Pyomyositis, bone or joint infections, bacteraemia and severe pelvic inflammatory disease.

Others include acute necrotizing Ulcerative stomatitis, Gingivitis or Periodontitis, unexplained Anaemia (< 8 g/dl), and or Neutropenia (<500/mm³) and or Thrombocytopenia (<50 000/ mm³) for more than one month.

Clinical stage 4 is characterized by the following clinical signs and symptoms; HIV wasting syndrome, Pneumocystis jiroveci pneumonia, Recurrent severe bacterial pneumonia, Cryptococcosis(extra pulmonary including meningitis), Cytomegalovirus disease(retinitis or infection of other organs including liver, spleen and lymph nodes), Chronic herpes simplex infection(or labial, genital or anorectal for more than one month; or visceral at any site), HIV encephalopathy, Kaposi's Sarcoma, Lymphoma(cerebral or B cell non-Hodgkin's), Disseminated non-tuberculosis Mycobacterium infection, Extra pulmonary tuberculosis, Progressive Multifocal Leucoencephalopathy(PML), Disseminated mycosis (Histoplasmosis, Coccidioidomycosis), Recurrent septicaemia(including non-typhoid Salmonella), Central nervous system toxoplasmosis, Oesophageal candidiasis (or candidiasis of trachea, bronchi or lungs), Chronic Isosporiasis, Invasive cervical carcinoma, Atypical disseminated leishmaniasis, Symptomatic HIV-associated nephropathy or HIV-associated cardiomyopathy.

Early presentation has better prognosis since care is initiated early and the full benefits of ART can be obtained as compared with late presentation with worse prognosis.

2.10 Factors associated with late presentation

Late presentation is not clearly defined as pointed out in a review of studies done across Europe, for example- a study reviewing articles published online after 1997 when ART was started in most developed countries showed that three main definitions were used in various studies defining late presentation for HIV care. These definitions were based on time from HIV diagnosis to AIDS diagnosis ranging from one year to one month, Another definition is based on CD4 counts ranging from 50/ μ l to 350/ μ l whilst a third

definitions is based on clinical presentation, all three definitions above were used in the study. This study also showed that being male, a migrant, being heterosexual, being older and living in low HIV prevalence areas are common characteristics associated with late presentation (Adler et al., 2009).

Despite the challenge of having a clear definition of what late presentation is it has been estimated that about 10-30% of patients present late for care in Europe (Battegay et al., 2008).

In the United States and Canada, a record review assessing the immune status of patients on initial presentation for HIV care from 1997 to 2007 in 13 US and Canadian clinical cohorts showed that though the burden of late presentation exist, over a period of 11 years there was an annual increase in the CD4 count at first presentation for care (Althoff et al., 2010) meaning over the years HIV patients present early for clinical care.

Another study in the United States reviewing records of patients attending a clinic for HIV care between 1996 and 2001, showed that about 40% presented late with factors associated with late presentation as being male, older age, injection drug use, unemployment (Krawczyk et al., 2006). Another study analyzing the clinical records of ART naive patients on initial visit for care at a hospital in the USA from 1990 to 2006 showed that CD4 cell counts at presentation decreased over time, factors identified to be associated with late presentation were male and older age (Keruly & Moore, 2007). Being female has also been identified as a factor associated with late presentation in a study done in the United Kingdom (Sabin et al., 2004).

A study in Germany reviewing clinical records from 2001 to 2010 showed that about 49.5% presented late with CD4 counts of less than 350, factors associated with late

presentation included older age and being a migrant (Zoufaly et al., 2012). Another study in new Zealand reviewing records from 2005 to 2010 showed about 50% of individuals presenting late for HIV care, factors found to be associated with late presentation were being older and being a heterosexual (Dickson et al, 2012). An Italian study also showed that being older and being unemployed is significantly associated with late presentation, this study also showed that about 60% of individuals presented late for care (D' Arminio Monforte et al., 2011)

A qualitative study of African Migrant key informants in the United Kingdom showed issues such as ability of the clinician to address HIV effectively, stigma, lack of access to community clinic, lack of cultural understanding and institutional barriers to care as factors associated with late presentation for clinical care (Burns et al., 2007).

Though few studies have been done in developing countries addressing the issue of late presentation to clinical care, the burden of late presentation cannot be ignored.

In Haiti late presentation for HIV care among patients in a health facility in 2004 was 65% and factors associated with late presentation included being male, older age, greater distance from medical facility, patients belief that symptoms are not caused by a medical condition, prior negative experience at local hospital, lack of prior access to effective medical care, previous requirement to pay for medical care and insurance status are associated with late presentation (Louis et al., 2007).

Studies that have been done in African countries though few as showed similar results with a higher burden of late presentation (Kigozi et al., 2009; Wanyenze et al., 2011).

In Uganda, a cross-sectional study of patient initiating care for HIV infection in a teaching hospital identified factors associated with late presentation to include male

gender, older age, lower educational level, unemployment, being unmarried and lack of spousal HIV disclosure (Kigozi et al., 2009). Another study in Uganda between 2008 and 2009 identified being male and being unemployed as factors associated with late presentation for care (Sendagire et al., 2012). Other factors found to be associated with late presentation in another Ugandan study were being male, a farmer and lack of family support (Muhamadi et al., 2011).

A study in Mozambique reviewing clinical records of adults initiating care for HIV infection from 2005 to 2009 showed that being female, younger, being unmarried, having at least a secondary education and being pregnant at presentation for care gave a lower likelihood of late presentation for care (Lahuerta et al., 2012).

A study in Ethiopia showed that being non pregnant, frequent use of alcohol and not disclosing status to partner is associated with late presentation (Abaynew et al, 2011).

In Malawian study factors identified to be associated with late presentation were being male and never being married (Parrott et al., 2011).

CHAPTER THREE

3.0 METHODS

3.1 Type of study

The study was a cross-sectional study of patients who are first attendants at ART clinic in Eastern regional hospital.

Electronically stored data and patient's folders were reviewed from January 2008 to December 2012.

3.2 Study location

The study was conducted at the adult ART clinic of the Regional hospital in Eastern region. The Eastern Region is one of the country's 10 administrative regions. It occupies a land area of 19,323 kilometers and constitutes 8.1 per cent of the total land area of Ghana. It is the sixth largest region in terms of land area. The region is bounded on the East by the Volta Region, South by Greater Accra region, West by Central Region and on the North by Ashanti Region. It has the largest number of health facilities in the country. From the 2010 census its population is 2633154. Agriculture and mining remain the main occupation of the inhabitants of the region. Koforidua is the regional capital. Mining draws commercial sex workers to the area.

The Eastern Region has one of the largest numbers of health facilities in Ghana, there are about 25 district hospitals and over 600 CHPS compounds. The Eastern regional hospital is the main referral centre for the region. HIV/AIDS programmes undertaken in the regions ART centers include antiretroviral therapy provision, testing and counseling, prevention of mother to child transmission of HIV infection (PMTCT), as well as Know your status campaign. ART clinic days vary from one health facility to the other.

3.3 Variables

The dependent variable was late presentation defined as WHO stage 3 or 4 of HIV infection on initial visit to the facility.

Independent variables studied were: age, sex, marital status, occupation, educational level, religion, number of dependent children, where client was referred from, source of funds for clinical care, for females whether they are pregnant or not, smoking, alcohol use, spousal disclosure, source of emotional support and condom use.

Table 3.3: Variables, operational definition and scales of measurement

Variable	Operational definition	Scale of measurement
Late presentation	WHO stage 3 or 4 of HIV infection	Ordinal
Early presentation	WHO stage 1 or 2 of HIV infection	Ordinal
Sex	Male/Female	Nominal
Age	In years	Discrete
Smoking	Smoker/ Non smoker	Nominal
Alcohol use	Drink alcohol/Non drinker	Nominal
Condom use	Condom user/Non condom user	Nominal
Spousal disclosure	Spouse has been told of HIV status	Nominal
Disclosure to family	Any family member has been told of HIV status	Nominal
Funding for care	Patient pays out of pocket/ with NHIS/ special project	Nominal

3.4a Study population

The study population were individuals above 15 years who attended the ART clinic for the first time between January 2008 and December 2012.

3.4b Inclusion and Exclusion Criteria

Individuals who were already on ART and coming from a different facility to continue care at the ART centre in Koforidua were excluded from the study.

3.5 Sampling

3.5a Sample size calculation

The following formula was used to calculate the sample size:

$$\text{Sample size, } n = \frac{z^2 \times P(1-P)}{d^2}$$

Where n = the sample size

z = a value corresponding to 95% confidence level = 1.96

P = the proportion or the prevalence of late presentation for HIV care in Uganda
= 40% (Kigozi et al., 2009).

d = error of margin I am prepared to allow around the true population value = 5%
Therefore $n = [(1.96)^2 \times 0.40(1-0.40)] / 0.05^2 = 0.92194/0.0025 = 368.776=369$

Assuming 10% invalid data=369+37=406, therefore about 410 folders were sampled for records review.

3.5b Sampling method

In determining the proportion of patients presenting at the various WHO clinical stages and the trends over the years electronically stored data was obtained from the data officer in charge of the ART program at the facility and used.

In determining the factors associated with late presentation clinical records from the folders of patients who attended the ART clinic from January 2011 to December 2012 was used. The folder numbers of all the patients attending the facility during 2011 to 2012 was entered into Microsoft excel and the random () command was used to select a sample of 410 folders for review.

3.6 Data collection method and tool

Clinical Records of first attendees between January 2008 and December 2012 was reviewed.

A compilation sheet was used to capture data from the 410 folders randomly selected from first attendees between 2011 and 2012. Key data extracted from these folders included WHO clinical stage of infection, age, sex, level of education, occupation, source of fund for health care, spousal disclosure, disclosure to family members, residence and current or ever use of alcohol.

3.7 Quality control

Quality control was ensured by the following measures; training of peer educators as research assistants who helped in the collection of data in order to capture the objectives of the research and supervising research assistant during data collection.

Data was entered twice each day and checked for accuracy of data entry. Folders with key missing data were not included in the analysis.

3.8a Data processing

Data obtained was entered into Microsoft excel, cleaned and transferred to Stata version 11 for analysis.

3.8b Analysis

Between January 2008 and December 2012, a total of 2055 patients older than 15 years visited the Eastern Regional Hospital ART clinic for the first time. Descriptive statistics using frequencies or proportions was used to describe this data obtained. Of the 2055 clients seen, 933 of them initiated care between January 2011 and December 2012. A total of 410 folders were sampled for analysis to determine factors associated with late presentation however data captured from 400 folders was used in the final analysis. Data from 10 of the folders were excluded in the final analysis because data related to time of initial visit or WHO stage at presentation was not clearly stated.

Bi-variate analysis using chi square was used to determine the association between the outcome variable late presentation and each of the independent variables, ignoring all other variables. This gave an initial idea on the independent variables strongly associated with late presentation. Variables with p value 0.05 or less were used to construct a model for the factors associated with late presentation for HIV care.

A multiple logistic model was then constructed with significant variables fitted in the model.

3.9 Ethical considerations

Ethical clearance was obtained from the Ethical Review Committee of the Ghana Health Service, Research and Development division in Accra. Permission was also sought from the Eastern Regional Health Directorate, the director of the Eastern Regional Hospital and the clinician heading the ART team at the facility.

Clinical records of patients were reviewed and the protocol indicated in the ethics section that only folder numbers should be used and not names were followed.

Data files obtained were password protected. Hard copy and electronic data were stored in locked files and access was limited to the principal investigator and supervisors of the study.

There was no informed consent sheet since individuals were not interviewed but a data capture sheet was used. The principal investigator had no conflict of interest in this study and the study was funded by the principal investigator.

CHAPTER FOUR

4.0 RESULTS

In determining the proportion and trends of clinical stages of HIV/AIDS infection among first attendees from 2008 to 2012, the records of all individuals reporting to the facility was used. This gives a total of 2055 of first attendees between 2008 and 2012. An average number of 411 first attendees were seen annually at the facility.

The records of 400 individuals first seen between 2011 and 2012 were then analyzed to determine the burden of late presentation and factors associated with late presentation.

4.1 Background Characteristics of first attendees

Of the 400 first attendees whose records were analysed, 228(72.0%) were females whilst 112(28.0%) were males (Table 1). Of the 228 female first attendees 100 were pregnant at the time of visit to the ART clinic. Majority 156(39%) of first attendees were between the ages of 30-39 years and 154(38.5%) were at least 40 years. The highest education attained by most of the attendees was JSS/MSLC 199(49.8%), with 68(17.0%) attaining primary education and 16(4.0%) attaining tertiary education. First attendees without education comprised 76(19.0%) of the study participants. Most of the first attendees 204(51.0%) came from towns in the Eastern region other than Koforidua, with 161(40.3%) coming from Koforidua and 35(8.8%) coming from towns outside the eastern region.

Among first attendees, 220(55.0%) were married, 83(20.8%) were single, 57(14.3%) were divorced or separated and 40(10.0%) were widowed. Christianity was the main religion.

The NHIS was the main source of healthcare funding for most of the first attendees 310(77.5%) and only 82(20.5%) of them paid for health care from their pocket. Among first attendees 345(86.2%) were employed at the time of visit to the ART clinic.

Table 1: Socio-Demographic characteristics of first attendees

Respondent	Number(% of cases	Percent with late presentation	Pearson chi square	P value
Age (years)				
<20	5(1.3)	20.0	24.24	<0.01
20-29	85(21.3)	21.2		
30-39	156(39.0)	31.4		
40+	154(38.5)	50.7		
Sex				
Female	228(72.0)	28.5	28.60	<0.01
Male	112(28.0)	57.1		
Residence				
ER-Koforidua	161(40.3)	28.6	7.57	0.02
ER-other	204(51.0)	41.2		
Outside ER	35(8.8)	45.7		
Religion				
Christian	367(91.8)	36.2	1.56	0.46
Muslim	31(7.8)	41.9		
Other	2(0.5)	0.0		
Educational level				
None	76(19.0)	42.1	4.72	0.32
Primary	68(17.0)	30.9		
JSS/MSLC	199(49.8)	33.7		
Secondary	41(10.2)	46.3		
Tertiary	16(4.0)	43.8		
Number of children less than 18 years				
None	155(38.8)	40.0	1.34	0.25
At least one	245(61.2)	34.3		
Marital status				
Married	220(55.0)	33.6	11.88	0.01
Single	83(20.8)	27.7		
Divorced/Separated	57(14.3)	49.1		
Widowed	40(10.0)	52.5		
Occupation				
Unemployed	55(13.8)	27.7	2.34	0.13
Employed	345(86.2)	38.0		
Funding for healthcare				
NHIS	310(77.5)	30.7	20.55	<0.01
Out of pocket	82(20.5)	57.3		
Other	8(2.0)	50.0		
Total	400(100)	36.5		

4.2 WHO Clinical Stage status of First Attendees

Of the 400 first attendees, 164(41.0%) were diagnosed at WHO stage 1, 90(22.5%) were diagnosed at WHO stage 2, 139(34.8%) were diagnosed at WHO stage 3 and 7(1.8%) were diagnosed at WHO stage 4 of HIV/AIDS infection.

Among first attendees 146(36.5%) clients presented late for care, with WHO stage 3 or 4 of HIV/AIDS infection while 245(63.5%) presented early with WHO stage 1 or 2 of HIV/AIDS infection.

4.3 Behavioural Characteristics of First Attendees

Majority of first attendees 323(80.8%) had not disclosed their HIV status to their sexual partners as at the time of visit to the ART clinic. Also up to 355(88.8%) of first attendees admitted not using condoms during sexual intercourse with their partners (Table 2). Most of the first attendees neither smoked nor used alcohol.

Table 2: Behavioural characteristics of First Attendees

Respondent	Number (%) Of cases	Percent with late presentation	Pearson chi square	P value
Disclosure to partner				
No	323(80.8)	38.4	2.59	0.11
Yes	77(19.2)	28.6		
Disclosure to family				
No	197(49.3)	30.0	7.19	0.01
Yes	203(50.8)	42.9		
Source of emotional support				
Family	203(50.8)	42.9	7.20	0.03
Friends	3(0.8)	33.3		
Other	194(48.5)	29.9		
Smoking				
No	370(92.5)	36.0	0.65	0.42
Yes	30(7.5)	43.3		
Alcohol use				
No	293(73.3)	32.1	9.22	0.00
Yes	107(26.8)	48.6		
Condom use				
No	355(88.8)	38.3	4.46	0.04
Yes	45(11.3)	22.2		
Total	400(100)	36.5		

4.4 Trends in WHO stages of HIV infection among first attendees from 2008 to 2012

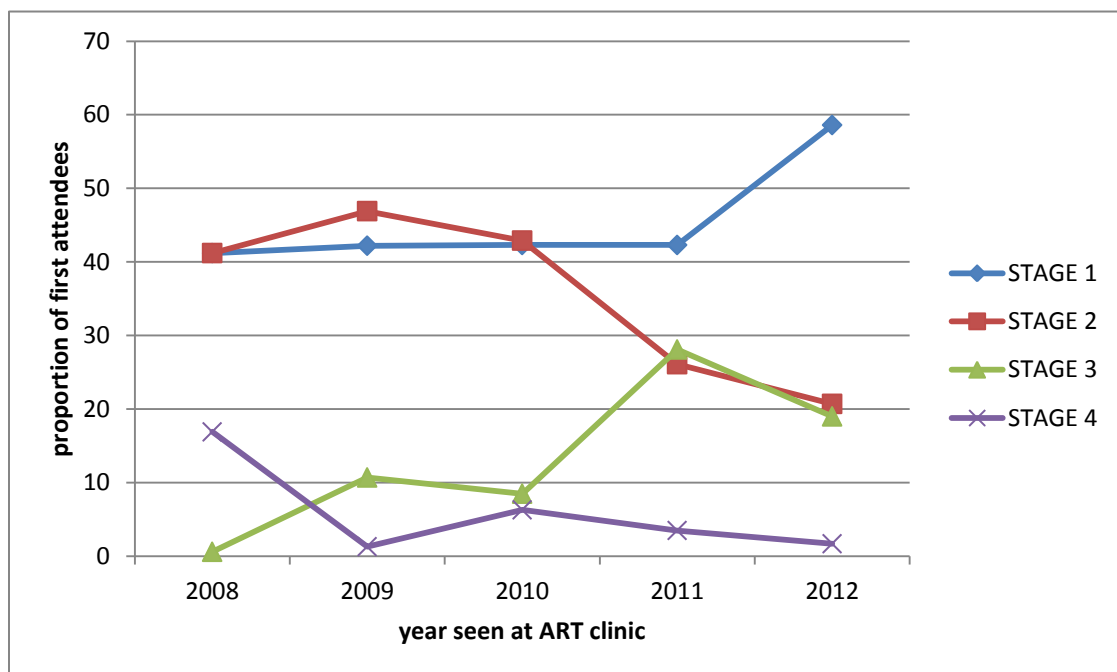
There has been a gradual increase in the number of first attendees being diagnosed with stage 1 of HIV/AIDS infection from 2008 to 2012 with a sharp increase of 246(58.6%) clients observed in 2012, (Figure 1). Among first attendees seen at WHO stage 2 of infection, there is an increase in the number of clients seen from 2008, 127(41.2%) to

2009, 149(46.9%). However: from 2010 to 2012 the number decreased from 213(42.9%) in 2010 to 134(26.1%) in 2011, further decreasing to 87(20.7%) in 2012. (Figure 2)

A clear pattern was not observed among first attendees diagnosed at WHO stage 3 of HIV infection as there was an increase in the number of clients seen from 2(0.6%) in 2008 to 34(10.7%) in 2009 and then decreasing to 42(8.5%) in 2010, rising again in 2011 with 144(28.1%) clients and decreasing again to 80(19.0%) in 2012. (Figure 2)

There has also been a gradual decrease in the number of first attendees diagnosed at WHO stage 4 of HIV infection with as many as 52(16.9%) of clients seen in 2008 to 7(1.7%) clients seen in 2012 at the ART clinic. There was a sharp drop in the number of clients seen observed in 2009, (Figure 2).

Figure 2: Trends in WHO stages of HIV infection among first attendees



4.5 Factors associated with late presentation

Sex was significantly associated with late presentation, p -value <0.01 (Table 1). Being male increases the odds of presenting late for care by over 300% as than being a female: unadjusted odds ratio was 3.35, 95% CI =2.13-5.27 p -value <0.01 , (Table 3). Residence was significantly associated with late presentation, p value=0.02 (Table 1). Among first attendees residing in towns in the eastern region other than Koforidua, the odds of presenting late was over 170% as than for those residing in Koforidua: unadjusted odds ratio=1.75, 95% CI=1.75, p -value=0.01, (Table 3).

Marital status was also significantly associated with late presentation: p -value=0.01(Table 1). Among first attendees being divorced/Separated increases the odds of presenting late by about 1.9 times more than being married: unadjusted odds ratio=1.9, 95% CI=1.06-3.43, p -value=0.03 whilst being widowed increases the odds of presenting late 2 times more: unadjusted odds ratio=2.18, 95% CI=1.10-4.31, p -value=0.03, (Table 3).

Age was significantly associated with late presentation p -value <0.01 , (Table 1): among first attendees being between ages 30-39 reduced the odds of presenting late for care by 55% as compared to those aged 40 years and above, (unadjusted odds ratio=0.45, 95%CI=0.28-0.71, p -value=0.01) while being between the ages 20-29 years reduced the odds of presenting late by 74% than those aged 40 years and above: unadjusted odds ratio=0.26 95%CI=0.14-0.48 p -value=0.01, (Table 3).

Table 3: Factors associated with late presentation among first attendees

Factors	Unadjusted odds ratio	95% Confidence interval (p value)	Adjusted odds ratio	95% Confidence interval (p value)
Sex				
Female	1.00		1.00	
male	3.35	2.13-5.27 (<0.01)	2.83	1.66-4.83 (<0.01)
Funding for healthcare				
NHIS	1.00		1.00	
Out of pocket	3.04	1.84-5.01 (<0.01)	2.57	1.49-4.46 (0.01)
Other	2.26	0.55-9.24 (0.26)	2.14	0.46-10.00 (0.33)
Family disclosure				
No	1.00		1.00	
Yes	1.75	1.16-2.65 (0.01)	1.34	0.41-4.45 (0.63)
Source of Emotional support				
Family	1.00		1.00	
Friends	0.67	0.06-7.47 (0.72)	0.41	0.03-6.37 (0.53)
Other	0.57	0.37-0.86 (0.01)	0.85	0.26-2.82 (0.49)
Alcohol use				
No	1.00		1.00	
Yes	2.00	1.27-3.14 (0.01)	1.21	0.71-2.07 (0.48)
Condom use				
No	1.00		1.00	
Yes	0.46	0.22-0.96 (0.04)	0.43	0.19-0.98 (0.04)
Marital status				
Married	1.00		1.00	
Single	0.76	0.43-1.32 (0.33)	0.99	0.50-1.95 (0.97)
Divorced/Separated	1.90	1.06-3.43 (0.03)	1.75	0.91-3.34 (0.09)
Widowed	2.18	1.10-4.31 (0.03)	2.07	0.97-4.42 (0.06)
Residence				
ER-Koforidua	1.00		1.00	
ER-other	1.75	1.13-2.72 (0.01)	1.43	0.87-2.37 (0.16)
Outside ER	2.10	1.00-4.45 (0.05)	2.10	0.91-4.84 (0.08)
Age in years				
40+	1.00		1.00	
30-39	0.45	0.28-0.71 (0.01)	0.77	0.45-1.30 (0.32)
20-29	0.26	0.14-0.48 (0.01)	0.57	0.27-1.23 (0.15)
<20	0.24	0.03-2.23 (0.21)	0.60	0.05-6.66 (0.68)

Source of funding for healthcare was significantly associated with late presentation, p-value<0.01 (Table 1). Paying out of the pocket for healthcare increased the odds of

presenting late by about 300% than for those with NHIS cover (Table 3): unadjusted odds ratio=3.04, 95% CI=1.84-5.01, p-value<0.01.

Alcohol use was significantly associated with late presentation p-value=0.01, (Table 2). Among first attendees using alcohol increases the odds of presenting late for care by 200% than for first attendees who do not drink alcohol: unadjusted odds ratio=2.00, 95% CI=1.27-3.14, p-value=0.01, (Table 3).

Similarly, condom use was significantly associated with late presentation, p-value=0.04 (Table 2). Among first attendees condom use with sexual partners reduced the odds of presenting late by 54% as compared to those who did not use condoms: unadjusted odds ratio=0.46, 95% CI=0.22-0.96, p-value=0.01, (Table 3).

Upon further analysis and adjusting for all factors associated with late presentation, being male (adjusted odds ratio=2.83, 95% CI=1.66-4.83, p-value<0.01), paying for healthcare from the pocket (adjusted odds ratio=2.57, 95% CI=1.49-4.46, p-value=0.01) and lack of condom use (adjusted odds ratio=0.43, 95% CI=0.19-0.98, p-value=0.04) during sexual intercourse with partners were significantly associated with late presentation, (Table 3).

CHAPTER FIVE

5.0 DISCUSSION

The finding from this study show that at the Eastern regional hospital ART clinic, there is a rise in first attendees diagnosed at WHO stage 1 of HIV infection generally from 2008 to 2012 whilst those diagnosed at with WHO stage 4 generally show a downward trend. This could be due to the effectiveness of HIV intervention programs at this facility which encourages patients with HIV infection to present earlier than later for care. It could also be explained by the fact that with increase awareness of the disease, testing facilities and treatment options individuals newly infected with the disease present early for care. The trend observed in this study is similar to a study in Mozambique where from 2005 to 2009 the proportion presenting late for care decreased from 46% to 33% (Lahuerta et al., 2012).

Also this study shows that at least 1 out of every 3 HIV infected persons presented late for care between 2011 and 2012 therefore missing the opportunity to receive the full benefits of ART which includes reduced mortality associated with HIV infection. A study involving 7 ART sites in the Latin America and the Caribbean showed that deaths among ART naive clients were associated with lower CD4 counts at initiation of care (Tuboi et al., 2009). A study in London also suggest late presentation increases mortality rates among HIV infected persons even after initiation of ART (Sabin et al., 2006).

The proportion of late presenters: that is individuals presenting with WHO stage 3 or 4 of HIV infection stands at 36.5% between 2011 and 2012. This figure may under estimate

the true burden of late presentation at this facility as WHO staging of HIV infection is based on clinical signs and symptoms and individuals with advanced disease who are without signs and symptoms are likely to be missed, the ability of clinicians to spot these signs and symptoms also affect the staging of HIV infection. A Ugandan study showed that using WHO clinical staging missed about half of patients with CD4 counts 200 cells/ul or less (Kagaayi et al., 2007).

Also this proportion of late presenters at this facility is higher than the findings in studies done in Europe where 10-30% of HIV infected individuals presents late for care (Battegay et al., 2008) but lower than a study done Haiti where 65% of HIV infected individuals presented late for care (Louis et al., 2007). This proportion is also lower than the findings in a Ugandan study where 40% of adult first attendees at an ART facility where classified as late presenters with WHO stage 3 or 4 of HIV infection (Kigozi et al., 2009). The number of people presenting late in all studies however reduces as the years pass and the benefits of ART and the availability of treatment increases.

Early presenters were younger (median age=34years IQR=13years) than late presenters (median age=40years IQR=14years). Most late presenters were at least 40 years. This finding of older age being associated with late presentation is consistent with findings in studies done in Europe (Adler et al., 2009). It is also consistent with studies done in Africa: in a Ugandan study late presenters were between the ages of 46-60 years (Kigozi et al., 2009) and findings in a study in Mozambique suggest that older age is associated with late presentation (Lahuerta et al., 2012).

Older people present late probably due to their lower risk perception as shown in a study in Venezuela (Bonjour et al., 2008) and Germany (Zoufaly et al., 2012).

Late presenters in this study were more likely to be males (AOR=1.78 CI: 1.01-3.57). This finding may be due to poorer health seeking behaviour among males than with females. A study on the health seeking behaviour of males suggests a trend of delayed help seeking when they become ill (Galdas et al., 2005). This finding of being male associated with late presentation for care, is similar to several African studies (Kigozi et al., 2009; Muhamadi et al., 2011; Parrott et al., 2011). It is also similar to the study in the USA (Keruly & Moore, 2007).

Females presented earlier for care than males. This may be due to a successful PMTCT programme being part of routine antenatal care, ongoing in the facility that links pregnant women with HIV infection to health care. Another explanation is better health seeking behaviour of women as compared to men. This finding of females presenting early for care was similar to several studies done (Kigozi et al., 2009; Lahuerta et al., 2012).

Residing in towns other than Koforidua increased the odds of presenting late for care. This may be due to the fact that individuals living in Koforidua have easier geographical access to the ART facility; individuals coming from outside Koforidua may be lacking facilities in their towns for HIV diagnosis and care. It may also be that due to the social stigma associated with the disease, individuals would rather travel to healthcare facilities outside their towns where it is easier to guarantee anonymity. A study in Haiti suggests that greater distance from medical facility is associated with late presentation among HIV infected clients (Louis et al., 2007).

Paying for healthcare at this facility from out of pocket was a significant factor for late presentation for HIV care (AOR=2.10 CI: 1.19-3.74). In developing countries cost of healthcare is a major barrier to healthcare access. Individuals without money to pay for their health care are likely to present late. A study in Vietnam found that in low income countries, individuals with health insurance are more likely to use OPD facilities (Jowett et al., 2004). A study in Haiti found previous requirement to pay for medical care and lack of insurance status as factors associated with late presentation for care among HIV infected persons (Louis et al., 2007).

Among first attendees condom use was significantly associated with late presentation, (AOR=0.43 95% CI=0.19-0.98). This may be because individuals who use condoms have a higher risk perception and are more likely to access a healthcare facility when ill. A study in Botswana showed that lack of perceived risk is barrier to HIV testing and care (Weiser et al., 2006).

Also this study showed lack of disclosure of HIV status to partners among first attendees was high, 89%. This may be due to stigma associated with the disease in our setting. However lack of disclosure of HIV status to partners is not associated with late presentation. These findings is different from that observed in the Ugandan study where lack of spousal HIV status disclosure was associated with late presentation (Kigozi et al., 2009). It is also different to findings in a study in Ethiopia where not disclosing HIV status to partner was associated with late presentation for care (Parrott et al., 2011)

Employment status was not associated with late presentation at this facility. This finding is dissimilar to the studies done in Uganda where being unemployed was associated with late presentation for HIV care (Kigozi et al., 2009; Sendagire et al., 2012).

5.1 Limitations of study

This study was a cross sectional study and the analysis on the burden of late presentation and factors associated with late presentation was based on a snap shot of attendees at Eastern regional hospital ART clinic. This does not reflect the proportion or the characteristics of late presenters in the eastern region who do not seek health care at this facility.

This study involved the use of secondary data that did not capture issues on HIV stigma, a major barrier for HIV testing and care in Africa, as a study in south Africa identified stigma as a major barrier to HIV testing and care (Kalichman & Simbayi, 2003).

CHAPTER SIX

6.0 CONCLUSION

HIV intervention programs in the Eastern Regional Hospital has improved as more individual have been presenting early for HIV care, with up to 63.5% of individuals presenting early with WHO stage 1 or 2 of HIV infection for care from 2011 to 2012 and less individuals are presenting late for care.

Late presentation for care defined by clients with WHO stage 3 or 4 of HIV infection on initial visit remains a burden (36.5%) despite HIV intervention programs at this facility. Factors associated with late presentation at this facility were being male, people who make out of pocket healthcare expenses, alcohol use, lack of a partner, residing far from the clinic and poor attention to one's own health as shown by the lack of condom use.

The public health implications of late presentation are huge as it is associated with increased mortality among HIV infected persons, increased cost of healthcare and increased risk of onward transmission to uninfected person. Fighting this HIV epidemic in our setting requires the need to address the burden of late presentation and the factors leading to late presentation for HIV care.

6.2 RECOMMENDATIONS

The number of first attendees presenting early for care has considerably increased, particularly in the two recent years, there is the need for further studies to find the factors behind this and direct policies if needed to further reduce the burden of late presentation.

HIV intervention programs should seek to address the factors leading to late presentation.

HIV care in the country is currently free however irrespective of the cost of services rendered patients pay 5.0 GHC which is taken as contribution to care and not as payment for care. Providing totally free care to HIV infected individuals and creating awareness that antiretroviral therapy for HIV infected persons is completely free at our health facilities could reduce the burden of late presentation.

This study highlights that as many as 81% of first time attendees have not disclosed their status to their spouses. Although with time clients are supported to disclose their status to their spouses, there is the need for further studies to investigate why clients do not disclose their status to their partners.

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APPENDIX**Data capture sheet**

1. Registration number

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2. Residence

.....

3. WHO stage of infection Stage 1.....Stage 2..... Stage 3.....Stage 4.....

4. Age (in years)

5. Sex Male.....Female.....

6. For Females Pregnant.....Not Pregnant.....

7. Marital status

Married.....Single.....Divorced.....

Separated.....Widow(er).....Cohabiting.....

8. Occupation

Full time.....Part timeOn leave.....

Unemployed.....

9. Education

NilPrimary.....JSS.....

MSLC.....SEC/Tech.....Tertiary.....

10. Religion

Muslim.....Christian.....Traditional.....

None.....Other.....

11. Number of Dependent children less than 18years

.....

12. Funding for healthcare

Patient out of pocket..... NHIS..... Other.....

13. Disclosure to sexual partner

Yes..... No.....

14. Disclosure to family

Yes..... No.....

15. Source of Emotional Support

Family..... Friends.....Other.....

16. Smoking

Yes..... No.....

17. Alcohol use

Yes..... No.....

18. Condom use Yes..... No.....