FACTORS ASSOCIATED WITH RETENTION IN CARE AMONG
PATIENTS RECEIVING ANTIRETROVIRAL THERAPY AT PANTANG HOSPITAL,
GHANA.

BY
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THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF
GHANA, LEGON IN PARTIAL FULFILMENT OF THE REQUIREMENT
FOR THE AWARD OF MASTER OF PUBLIC HEALTH DEGREE.

JULY, 2018
DECLARATION

I, Safia Abdallah hereby declare that this work is a result of my independent work under the supervision of Dr. Bismark Y. Sarfo. References to other works have been duly acknowledged. I further declare that this work has not been submitted for award of any degree in this institution and other universities elsewhere.

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DR. BISMARK Y. SARFO
(ACADEMIC SUPERVISOR)

........................................
DATE

........................................
DATE
DEDICATION

I dedicate this work to Mrs. Ayisha Abdallah (Mother) for always being there for me. Also, to my Brother Alhaji Iddrisu Abdallah and to all my family members especially Zainab and Adiza for their enormous support throughout this period.

I also dedicate this thesis to my siblings especially those who have supported me throughout the period of my academic programme.

Again, I appreciate the support received from my academic supervisor, Dr. Bismark Sarfo.
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I wish to express my deepest gratitude to the Almighty God for the unflinching guidance and grace on me throughout my studies.

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My sincere thanks also goes to the Management and staff of Pantang ART center for allowing me to use their health facility as my study site as well as mobilizing the participants for data collection.

Finally, I sincerely thank Dr. Collins Ahorlu (HOD) department of Epidemiology and Disease Control, Noguchi Institute For Medical Research and all lecturers of the Department of Epidemiology and Disease Control as well as all my friends especially for their endless support throughout this period, I say thank you and God bless you.
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<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<tr>
<td>AIDS</td>
<td>Acquired Immune Deficiency Syndrome</td>
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<td>TB</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>USAID</td>
<td>Joint United Nations Programme on HIV/AIDS</td>
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<td>STI</td>
<td>Sexual Transmitted Illness</td>
</tr>
<tr>
<td>NACP</td>
<td>National AIDS/STI Control Programme</td>
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<tr>
<td>PMTCT</td>
<td>Prevention of Mother-To-Child Transmission</td>
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<tr>
<td>PLHIV</td>
<td>Persons Living with HIV/AIDS</td>
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<td>ART</td>
<td>Antiretroviral Therapy</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<tr>
<td>SSA</td>
<td>Sub-Saharan African</td>
</tr>
<tr>
<td>GAC</td>
<td>Ghana AIDS Commission</td>
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<tr>
<td>CD4</td>
<td>Cluster of Differentiation 4</td>
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<td>MOH</td>
<td>Ministry of Health</td>
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ABSTRACT

Background: For effective outcomes of Anti-retroviral therapy (ART), people who are diagnosed of HIV and linked to care must remain in care and subsequently go through each step of the care continuum. However, persons are lost to follow-up at each stage of the continuum due to reasons including psychological, socioeconomic and health systems ineffectiveness. This study determined the factors associated with Retention of people living with HIV (PLHIV) in care at Pantang Hospital.

Method: The study design was cross-sectional. 289 PLHIV were sampled and data was extracted from their medical records and interviews were conducted using a structured questionnaire Analyses was done using Excel and STATA where frequencies, proportions, percentages, bivariable and multivariable regression analyses were performed.

Results: Out of the 289, 202 representing 70% were retain in Care. The chi-square test revealed that age, occupation, TB-screening, presence of opportunistic infection, WHO clinical stage of the disease were significantly associated with retention at 12 months. Participants who were self-employed were 11 times more likely to be retained in care (AOR=11.00, CI (2.55-74.71), P-value<0.05). Absence of Opportunistic infection reduces the odds of being retained in care by 69% (AOR= 0.03, CI=0.09-1.00 p-value=0.051)

Conclusion: About 70% (202/289) of PLHIV at Pantang ART clinic are retain in care. Retention is associated with age, self-employment, TB screening, opportunistic infection and clinical stage of the disease.
CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Globally, there has been reported cases of new infections of HIV with approximately thirty six million people currently living with HIV with majority of this reported number residing in sub-Saharan Africa (Heestermans, Browne, Aitken, Vervoort, & Klipstein-grobusch, 2016). In Africa, the number of individuals assessing treatment for HIV&AIDS has seen a tremendous increase in the last decade due to the advent of innovative treatment methods (ART), For sustainable outcome of ART usage, there should be a continuous supply of drugs to clinics and effective adherence of patients to treatment. This will thus help to bridge the gap in seeking care leading to a prolong life of PLHIV (Straub & Tanner, 2018).

The vital goal of HIV management is to achieve undetectable viral load to enable people living with HIV to have extended lifespan and to overcome premature death related to the disease. Furthermore, in other to realize the public health benefits of having extended lives for PLHIV, the general population should be aware of their HIV status by having access to readily diagnostic avenues, and for those who test positive to be link to care and retain in care. Continual access to ART and other medical services like counselling, Prevention for Mother to Child transmission (PMTCT) in pregnancy, provision of mental health services, behavioral change communication (BCC) are some importance of retaining people in HIV care.

However, over the years, there has been reported incidence of gaps in the care continuum on the issue of retaining PLHIV in care in the African region and Ghana is not an exception to this menace.
In Ghana, PLHIV face challenges that are similar to those faced by PLHIV in other settings, which stems from individual and facility related factors.

Several patients factors have been associated with reduced retention in care, among these are demographic characteristics including patients age and gender. Studies have shown the alarming rate at which male gender affects retention in HIV care. (Costa, Torres, Coelho, & Luz, 2018)

A meta-analysis studies conducted in sub Saharan Africa has established that there was decreased engagement to HIV care among Men after diagnosis compared to women and also they have the potential to influence their partners decision to engage and remain in HIV care services(Tucker et al., 2017).

A seven year cross-sectional review of retention in HIV care and treatment in a medical center in Ido-Ekiki in Nigeria found a significant association between age and retention status, and that older adults (less than or equal to 50years) had improved retention compared to younger PLHIV (less than or equal to 15 years (Amico, Soriano, Minick, May, & Giordano, 2018).

Factors such as clinical and laboratory characteristics, transport costs, income, marital status, family support , social linkages, waiting times at clinics, and poorer organizations have effect on retention of PLHIV in care in Africa (Geng et al., 2011,Heestermans et al., 2016,Barroso, Leblanc, & Flores, 2017).

Factors including location of ART center, modules or type of strategy used to render care either primary (community based clinics, health centers) secondary (district hospitals), or tertiary (Regional hospitals) have been identified to influence retention of PLHIV in care (Rachlis et al., 2016),
A study in Nigeria demonstrated that, patients who have good relationship with their care givers have improved retention than their counterparts with poorer patient-client relationship (Straub & Tanner, 2018).

Much emphasize is given to the importance of retaining individuals in care in the setting of using treatment as a form of prevention strategy treatment as prevention (TasP). TasP leads to the timely and sustained use of highly active antiretroviral therapy (HAART) to basically eradicate the risk of HIV advancement to AIDS that will ultimately lead to premature death (Koirala et al., 2017).

A vast number of studies have indicated with worry the rate at which people who are not retained in care transmit the infection to other individuals in the general community. Lourenço and his colleugues in their work on HIV demonstrated that, individuals diagnosed but not retained in HIV care accounted for the greatest proportion of transmissions in the USA (Lourenço et al., 2016).

Nonetheless, patients on ART, who are retain in care stand the chance of continual receipt of their medication, thus there is a chance to evaluate the occurrence of medication toxicities, and ascertain treatment failure when it occurs in order to change regimens. In addition, retaining PLHIV on ART in care provide ancillary services, identification of patients who require home base care, social support services, and secondary prevention messages that helps patients live long and prevent complicated infection (Geng et al., 2011). In Sub Saharan-Africa, studies assessing the importance of retention of PLHIV in care have indicated that patients linked to care and retained have presented with low mortality as compared to those loss to follow up (Holtzman, Brady, & Yehia, 2015),(Jain, Maulsby, Kinsky, Charles, & Holtgrave, 2016) & (Cawley et al., 2017).
For patients who are not on ART, retaining them in care enables Clinicians and care takers to monitor them and also provide prophylaxis treatment as well as initiate ART once indicated (Nugroho et al., 2018).

A recent longitudinal study demonstrated that reduced retention leads to reduction in quality of life of the individual, increase chance of transmission and increase morbidity and mortality (Richey, Halperin, Pathmanathan, Van Sickels, & Seal, 2014). The same study also indicated that, reduced retention is because of inconsistency in seeking care.

A study demonstrated that in order to obtain optimum retention and adherence, PLHIV should be loved and provided a sense of belonging in the form of support, motivation and reminders from family, friends and caregivers (Barroso et al., 2017). Recent studies indicated that retention in care is poor across Africa, with an estimate of around 50% to 70% across various facilities at two years after ART initiation (Amico et al., 2018), (Heestermans et al., 2016), (Maulsby et al., 2017). Identifying local factors associated with retention in care is key in preventing loss to follow up of patients.

**Retention in HIV Care**

Retention in care as reported in many studies measures the number of CD4 tests care visits at least 6 months apart during a 12 month period. This method is referred to as consistency in seeking care and has been widely used to estimate retention in HIV treatment (Ulett et al., 2009).

In this study, retention was measured as a visit to a healthcare center (Pantang) at least once every six month during a twelve month period or in a year for any HIV related service. Against the background that most HIV facilities do not have machines for CD4 testing in Ghana.
1.2 Problem Statement
Retention in care is one of the key component of the HIV care continuum. It leads to individual and public health benefits of attaining complete ART benefits and serves as a link to preventive services. There is also realization of optimum adherence to medication and prevention of co-morbid infection and complications (Holtzman et al., 2015).

However, keeping people in care in resource-limited settings is faced with a number of challenges that cannot be over emphasized. People are lost to follow up and consequently they get out of care due to several factors.

In Ghana, there is paucity of data on factors affecting retention in HIV care. Both facilities and national factors associated with retention in care have not been adequately identified. With the issue of distance to where care is located, stigmatization, discrimination, non-availability of drugs, socio-economic challenges, weak health care system, many factors affect retention of PLHIV in care in Ghana and they must be identified.

This study assessed the factors associated with retention in care at Pantang ART clinic in Accra,

1.3 Justification of the Study
The number of people living with HIV (PLHIV) who are receiving anti-retroviral therapy (ART) in sub-Saharan Africa has seen a gradual increase in the past 10-15 years as a result of improved provision and uptake of HIV testing services and policies. It is important to retain these patients in care.

The Ghana AIDS Commission’s HIV Sentinel Survey Report in 2013, indicated that, 7,812 new infections were recorded and the need for ART is projected to be 125,396 (Ghana AIDS Commission, 2013). HIV/AIDS and HIV infected individuals remain reservoirs that could lead
to any future upsurge in viral transmission in the country, which, requires that both local and regional factors associated with retention in care needs to be addressed to enhance control activities.

This study will provide information about the factors affecting retention of HIV patients attending antiretroviral clinics at Pantang hospital in Accra. It will help develop a national HIV/AIDS strategy towards retention in care, which can provide more vigorous monitoring from the facility to national level. This will lead to policy development and implementation of established and evolving interventions in ART clinics. Furthermore, it will enhance ART use and drug adherence. This will manifest in viral load suppression, eliminate co-morbid infections and improve clinical outcomes.

1.4 Research Questions
   i. What proportion of the HIV patients were linked to care at Pantang ART?
   ii. What proportion of those linked to care remained in care for the 12 months duration?
   iii. What individual based factors are associated with patients who have remained in care?

1.5 General Objective
To determine factors associated with retention in care among HIV patients receiving ART at Pantang hospital in Accra, Ghana.

1.5.1 Specific Objectives
   i. Determine the proportion of patients who were retained in care during the study period.
   ii. Determine individual factors associated with retention in care.
CONCEPTUAL FRAMEWORK FOR FACTORS AFFECTING RETENTION IN HIV CARE.

Figure 1 Conceptual Framework of the study:

- Demographics (Gender, age, marital status, education)
- Health beliefs (Spiritual or religious)
- Access to care, (Location of care, clinic distance, patient-client relationship, waiting time, availability and drug refill)
- Retention in care (Measure as seen in care for at least 6 months apart in a year)
- Clinical Characteristics (Stage of HIV/AIDS, CD4 counts, Mental illness and Stigma)
- Transportation
- Income level
- Family Support, Outreach programs
Narration

The conceptual framework identifies factors that influence retention in care: Demographic characteristics such as age, gender, Marital status and education influences retention in care. Example it is believed that, educated people are more likely to complete their treatment.

Clinical characteristics including stage of illness, mental illness, CD4 count also influence retention. It is believed that, people with severe illness are more likely to stay in treatment and this influences retention.

Family support and outreach programs influences access to care because the more people are exposed to outreach programs or educated on their condition, either from the family or healthcare providers the more likely they are to know where to seek help from and this influences access to care which intend affects retention in care.

Income level; Peoples income level influences where they access care which intend influences retention in care.

Transportation influences access to care including distance to ART centers which in turn influences retention in care.
CHAPTER TWO

LITERATURE REVIEW

Introduction

Literature was accessed by first typing the topic into a search engine such as (PubMed, Google scholar, Hinari etc.) and the literature that came up were selected. Those that were relevant to the study were printed for review and subsequent information was taken and was duly cited for the purposes of the work.

2.1 The HIV AIDS Pandemic
The HIV/AIDS epidemic was first identified among gays in Los Angeles in 1981, and over the years about 55 million and more than 20 million have lost their lives or have had a permanent deformity as a result of the infection (International, 2014). AIDS is the leading cause of death in sub-Saharan Africa and the fourth leading cause of death worldwide (Lourenço et al., 2016a).

In the last decade, particularly there are signs that the pandemic may be changing course as new HIV infections and AIDS related deaths have significantly declined, contributing to an overall stabilization of the pandemic. This may be due to the numerous prevention strategies put in place, which includes increase awareness creation, education, provision and use of condoms, abstinence, prevention of mother to child transmission and other preventive methods. Furthermore, global incidence has fallen from 3.1 million infections in 2000, to 2 million infections in 2014, representing a decrease of 35% in new infections (Lourenço et al., 2016b). However, there is still high number of new cases of HIV and AIDS related illness occurring each year.
United Nations General Assembly Special Session on HIV/AIDS (UNGASS) in 2001 set global targets for reducing the spread of HIV/AIDS and lessening its effect on the world by 2020. This calls for effective diagnoses of all people living with HIV (PLHIV), providing antiretroviral therapy (ART) for all diagnosed patients and achieving viral suppression from adherence (Medlock et al., 2017). The global HIV Fact Sheet in 2014, reported that new HIV transmission in sub-Saharan Africa declined by 33% between 2005 and 2013 (UNAIDS, 2014).

2.2 HIV in sub-Saharan Africa
Sub-Saharan Africa is considered as the continent most hit with the HIV/AIDS pandemic. Of the over 34 million people living with HIV globally, about 24 million are living in sub-Saharan Africa (UNAIDS, 2014).

Children living with HIV in sub-Saharan Africa continue to experience gaps in treatment despite the efficacy of early antiretroviral therapy (Adeyinka et al., 2017). Despite all the effort towards reduction of deaths in children under five, pediatric HIV still contributes significantly to preventable child morbidity and mortality in the continent due to lack of diagnostic and treatment services for HIV-infected children.

2.3 HIV/AIDS in Ghana
The Government of Ghana has responded to the HIV/AIDS epidemic by building an enabling environment through continued strong political commitment at the national, regional, district and sub-district levels. The HIV/AIDS epidemic has exhibited a different pattern from that found in many other parts of sub-Saharan Africa due to the government’s efforts towards its reduction and eradication. The government has signed or subscribed to a number of continental and international HIV control programmes, which led to rates of HIV/AIDS remaining relatively low and stable.
Presently the Government of Ghana subsidizes the cost of care including ART by nearly 90%, making it available at roughly $5 per month (GAG, 2005). In Ghana, HIV prevalence is lowest amongst the poor and unemployed with increase prevalence amongst the educated and working class group. (UNAIDS, 2013)

2.4 Antiretroviral Therapy
Antiretroviral therapy is a treatment that suppresses or treats a retrovirus. Antiretroviral agents are virus static agents which block steps in the replication of the virus. The drugs are not curative; however, continued use of drugs, particularly in multi-drug regimens, significantly slows disease progression. There are three main types of antiretroviral drugs, although only two steps in the viral replication process are blocked. Nucleoside analogs, or nucleoside reverse transcriptase inhibitors (NRTIs), such as didanosine (ddI, Videx), lamivudine (3TC, Epivir), stavudine (d4T, Zerit), zalcitabine (ddC, Hivid), and zidovudine (AZT, Retrovir), act by inhibiting the enzyme reverse transcriptase.

Single or dual ART’s are used in some cases of ART medication, but in Ghana triple combination of ART’s are used. Over 138 public and private facilities are providing ART in all regions and about 60% of districts in Ghana. According to the Ghana AIDS commission the number of persons accessing treatment has increased from 2,017 adults and children in four sites in December 2004, to 33,745 by the end of 2009. It is estimated that 123,245 PLHIV (110,494 adults and 12,751 children) were put on ART in 2015 in line with universal access targets (Source: HIV/AIDS/ STI Control Programme, G. (2010).
### 2.5 Recommended ARVs in Ghana

**Table 1 Recommended ARVs in Ghana**

<table>
<thead>
<tr>
<th>Nucleoside Reverse Transcriptase Inhibitors (NRTI)</th>
<th>Nucleoside Reverse transcriptase inhibitor (NtRTI)</th>
<th>Nucleoside Reverse Transcriptase inhibitor (NNRTI)</th>
<th>Protease Inhibitor (PI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zodovudine (AZT/ZDV)</td>
<td>Tenofovir (TDF)</td>
<td>Nevirapine (NVP)</td>
<td>Ritonavir boosted Lopinavir (LPV/r)</td>
</tr>
<tr>
<td>Lamivudine (3TC)</td>
<td>Efavirenz (EFV)</td>
<td></td>
<td>Ritonavir boosted Atazanavir (ATV/r)</td>
</tr>
<tr>
<td>Abacavir (ABC)</td>
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<td></td>
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<tr>
<td>Emtricitabine (FTC)</td>
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Currently, over 138 public and private facilities are providing ART in all regions and about 60% of districts in Ghana.

### 2.6 Retention in HIV care Care

Retention in care is the most challenging step along the HIV care continuum. Many patients who achieve viral suppression whiles in care experience interruptions characterised by continuous moving in and out of care. This is because, as the number of ART patients increases, retaining patients in care becomes a major challenge especially in a low resource country like Ghana. In
sub Saharan Africa, the mean retention rate has decreased over time as reported by systematic reviews and meta-Analysis studies (Matyanga et al., 2016).

A number of studies have reported higher retention rates across sub Saharan Africa. In a meta-analysis review including 78,424 infected children from over 30 countries to assess the retention of HIV infected children in the first twelve (12) months of ART and predictors of attrition in resource-limited setting, retention rate was between 71%-95% (Abuogi, Smith, & McFarland, 2016).

Another study reported a retention rate of 84.4% at twelve (12) months when assessing the role of mental health utilization on retention among PLHIV at a University affiliated HIV clinic (Saag, Tamhane, Batey, Mugavero, & Eaton, 2018).

2.6.1 Individual factors associated with retention in care

In low resource setting like Ghana, HIV/AIDS patients in care are faced with numerous challenges that impede their ability to access care to help in the realisation of its full benefit.

Disruptions in care may undermine any individual gains in clinical outcomes and the interruption of ART can lead to treatment failure, and associated drug resistance with disease progression. As such, it is important to identify both the structural and the patient factors that leads to poor retention.

Demographic factors such as gender and age have been identified among the several patient factors to be connected with becoming inconsistent in seeking care. Other factors include clinical or laboratory characteristics (e.g., stage of disease or CD4 count), socio-economic factors including transport costs and income and social factors such as marital status have all been implicated in retention in care (Rachlis et al., 2016).

In Ghana, people living with HIV (PLHIV) are compelled to cancel appointments to ART centers for medication and treatment due to the issue of transportation(Tuller et al., 2010). It is
evident that, the closer the ART center is to the patients home, the less the stress and cost to reach it and thus increasing chance of visits. Funds that are set aside for transportation are at times channeled to other avenues like paying of childrens school fees and purchase of food to feed the family. A study in Uganda to assess how transportation costs impede sustained adherence and access to HAART in a clinic population in Southwestern Uganda indicated that, even when patients have a high level of commitment to medication adherence, economic factors, particularly the high cost of transportation for monthly clinic visits are an important challenge to sustained treatment success (Tuller et al., 2010).

Higher literacy of HIV treatment by patients could also lead to improved retention. A study among Indonesian HIV positive MSM and transwomen indicated that those who had adequate retention had knowledge on HIV, and this includes using the internet to access some form of HIV information (Nugroho et al., 2018).

2.7 Demographics and Retention in Care

Antiretroviral therapy is a lifelong activity needing distinctive strategies to ensure its effectiveness. A study by Lourenço et al., in 2016 to assess the factors relating to retention amongst 185 patients seeking care at a hospital indicated that being a male was associated with a higher retention in care (Lourenço et al., 2016). In addition, women, people who inject drugs (PWID), those with other/unknown HIV transmission risk were found to be less likely to be retained after being linked to care. The same study also found that, individuals under 40 years of age had a higher chance of being retained in care compared to other age groups. Similarly, a study involving seven countries in Asia to identify facilitators and barriers for retention in HIV care between testing and treatment found that young PLHIV (18–24 years of age) are less likely
to ‘seek’ and ‘test’, thus they are less likely to engage in and retain in care. This age group has been one of the key groups with increase attrition to retention despite the global scale-up of ART since 2005 which has contributed to a 35% reduction in overall HIV-related mortality. (Olaniyan & Owoade, 2015) Nonetheless, actions to reach young people have not been effective enough. Worldwide, young and adolescents have an increase AIDS mortality of about 50% from 2005 to 2012 (Koirala et al., 2017).

2.8 Stigmatization and Retention in Care
Rejection to services, education, social events and often delayed response to treatment are associated issue around stigma related to HIV. Individuals who are discriminated upon feels depressed which affects their health seeking behaviour (Olaniyan & Owoade, 2015). A secondary data analysis by Zuniga and colleagues to assess the role of Depression in Retention in Care for Persons Living with HIV reported symptoms of depression that also overlap with symptoms of HIV infection itself may impede the quality of their engagement in and adherence to treatment recommendations (Zuniga, Yoo-Jeong, Dai, Guo, & Waldrop-Valverde, 2016).

Stigmatization is more related to the issue of lost to clinic, even though it can eventually lead to lost to care. Women and children are often more affected when it comes to the issue of stigma. According to the World Health Organization, there is improved retention in a stigma free environment or amongst PLHIV who suffer minimum stigmatization from families (WHO, 2011). Again, support system tends to be a good contributory factor to maximise retention. Patients who implement reminder tactics such as calendars, pillboxes and using alarms and reminder calls are less likely to forget appointments and medication doses (Holtzman et al., 2015).
2.9 Facility Level Factors and Retention

In developing world, not much attention has been given to the various facility level factors that affects retention as compared to the individual based factors. Research has outlined various facility factors that affect retention to include patients’ clients’ relationship, turn around time and availability of drugs and the module of care used by the center. A retrospective cohort study by Rachilis and his colleagues in 2016 to assess the facility based factors that affect retention in East African countries including Uganda, Kenya and Tanzania had the findings that provision of onsite laboratory services and faster results turnaround time was associated with reduced lost to follow up (LTFU) and thus improved retention.

2.9.1 CD4 level

CD4 counts has been associated with worse retention. Individuals with either low or high CD4 counts have worse retention history. (Lourenço et al., 2016). Other studies in China including the China National Treatment cohort, reported lower baseline CD4 to be associated with lower rate of missed visits on-ART patients. (Lourenço et al., 2016) The bidirectional nature of this association may be because patients with high CD4 counts are more likely to move for work and also carry out their usual activities as compared to those with low CD4 levels who are at risk for unascertained deaths that appear to be failures of retention (Geng et al., 2011).

2.9.2 Provision of case management services

Supporting patients living with HIV manage their condition with services like counselling, nutritional support and mental health services provided by ART centers helps in improved CD4 counts and related outcomes like retention in care. A study by Sarfo et al.,(2017) indicated that, case management support services are associated with improved CD4 counts of patients
receiving care at the antiretroviral clinic of Pantang Hospital in Ghana (Sarfo, Vanderpuye, Addison, & Nyasulu, 2017). Some of these support services includes counseling, mental health, and case management services improved CD4 counts in patients receiving ART. It is anticipated that nutritional counseling would be an integral component of support services that HIV/AIDS patients should receive at ART clinics as it indirectly relates to retention in care by improving CD4 counts.

Additionally, due to the effect HIV diagnosis has on mental health of the patient, the introduction of HIV counselling and other mental health care services at facilieies has been found to be associted with improved retention in care for PLHIV (Saag et al.,2018).

2.9.3. Education and Retention in Care
Education in the form of related health information is needed to enable PLHIV have up to date information on their health condition. Service delivery has seen a tremendous improvemnet over the years due to the advent of newer technologies and the use of social media to help maximise HIV testing and access to treatment and care. The use of ehealth as a means to engage and retain people in care as been identified to be effective by most researchers. A systematic review in the Asia to identify the impact of electronic and mobile technologies in medical care and retention of PLHIV in care made interesting observations about how eHealth can be used to improve patients adherence through collective HIV testing and re-testing in priority populations across the HIV treatment and care cascade in the Asia-Pacific region. It aslo identified that, eHealth involvements was very paramount in the attempts towards ending the AIDS epidermic with much focus on key populations(Purnomo et al., 2018).

A study by Hendricks and colleuges in South Africa in 2018 to evaluate the extent to which the use of an educational video as a consent tool had on knowledge and preparedness of PLHIV
about cure research at HIV clinics demonstrated that, a video intervention could improve participants’ knowledge related to HIV retention in care, HIV cure research and related ethics. This improvement in HIV uptake of services was sustained over 3 months (Hendricks et al., 2018).

In addition, in 2015, a study was conducted among HIV positive patients from the Special Immunology clinics affiliated with the University of Miami, Jackson Memorial Hospital and the Borinquen Community Health Center in South Florida to access the impact of health literacy on health outcomes (Retention in care), retention was higher among patients with high health literacy which was informed by their demographic characteristics and social support resources (Waldrop-valverde, Guo, Ownby, & Rodriguez, 2015).

2.9.4. Family Support and retention in Care
The family in most setting across the world is seen as a strong tool where hope, love and reassurance is obtained. For Persons living with HIV, having a supportive family could serve as a break through for the individual to attain the required health outcome. Patients who disclose their status to their family members have sustained support systems, are faced with reduced stigma and discrimination and also have a sense of belonging. Greater use of social support was protective for those with poorer neurocognitive functioning, such that those who were cognitively impaired but used more social support had higher medical visit adherence; the less one used social support, the more negative the impact of neurocognitive functioning on medical visit adherence (Waldrop-valverde et al., 2015).

2.10 Socio-economic status and retention in HIV care
Lifelong ART is essential to reducing complications and ending the HIV epidemic. However, there is an interplay between socio-economic status and HIV outcomes in Sub Saharan Africa is not well exploited. For successful outcomes and scale up in ART, patients socioeconomic status
including kind of employment, level of income, education and wealth cannot be overemphasised.

Poorer HIV survival and outcomes has been reported across the African settings among PLHIV receiving care in low resource settings, where there is low formal education and homelessness.

A prospective cohort study among HIV-infected ART patients in Ugandan adults who initiated ART between April 2004 and April 2005 at the Infectious Disease Institute clinic in Kampala demonstrated that, virologic failure was significantly associated with age >40 years and self-employment compared to unemployment (hazard ratio, 0.60; 95%CI, 0.37–0.98) also employment and household income was found to be related with improved retention (Flynn et al., 2017).

Gwynn et al. found out that, socio-economic status and social support may be important determinants of retention in patients not yet eligible for ART socio-demographic and social support factors were protective against LTF in both men and women (Gwynn et al., 2015).

2.11 Religion and Retention in HIV care

In Africa and across the world, religion has an important role to play when it comes to issue of health and health related conditions. Beliefs about ART success are paramount for effective ART outcomes. A study in Zambia in 2013 looked at the the frequency of false beliefs about ART in 389 ART patients. Among Christians, the frequent health belief held was the belief that, pastors can cure HIV infection through prayers and immune boosters can be used to supplement ART’s and this observation was found to be significantly associated with decreased ART adherence and retention in HIV care (Nozaki et al., 2013).
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Study Sites and Population
The study was conducted in the Pantang sub-municipality – at Pantang Hospital ART Center located in the La-Nkwantantanang Madina Municipality of the Greater Accra region of Ghana. The Pantang Psychiatric hospital is one of the accredited ART Centers in the Greater Accra region.

The Pantang hospital has two major health departments, the general hospital care services department and specialized psychiatry care hospital department.

The ART center is attached to the general hospital care services. The Pantang ART center started in 2006 as an HIV testing and counseling unit of the Pantang General Hospital.

In 2008, the unit was designated as an ART center to start offering full ART services. Currently the center renders HIV testing and counseling, provision of antiretrovirals (ARVs), Prevention of Mother-to-Child Transmission (PMTCT) services and community health education on HIV&AIDS services. There are over 800 HIV/AIDS patients including 20 children receiving ART services at the center presently.
3.2 Research Design
The study design was a cross-sectional study which examines the factors that are associated with retention in care among the HIV/AIDS patients. This was done in two ways, namely extraction of data from medical records of participants and administration of closed-ended questionnaire.
3.5 Variables

3.5.1 Dependent variable (Retention in care)
Retention in care in this study is categorical variable and measures the number of CD4 tests care visits at least 6 months apart during the 12 months period. This measure is referred to as consistency in care and has been widely used to estimate retention in HIV treatment (Ulett et al., 2009). However, in this study, retention is measured as having visited the ART clinic at least twice or more within a year for care.

3.5.2 Independent Variables
- Patient related factors: Socio-demographic information: age, sex, marital status, education level, employment status and religion, Medication: Drug line / Type of drug.
- Individual factors: Transportation, Social Support: Funding, family support system.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Operational Definition</th>
<th>Scale of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Individual ages to be grouped subsequently</td>
<td>Ordinal</td>
</tr>
<tr>
<td>Sex</td>
<td>Male or female</td>
<td>Nominal</td>
</tr>
<tr>
<td>Screening for TB</td>
<td>Yes // No</td>
<td>Binary</td>
</tr>
<tr>
<td>Screening result</td>
<td>Positive or Negative</td>
<td>Ordinal</td>
</tr>
<tr>
<td>Marital status</td>
<td>Married, cohabiting, Divorced, Widower to be grouped</td>
<td>Nominal</td>
</tr>
<tr>
<td>Occupation</td>
<td>Fully employed, part time to be grouped</td>
<td></td>
</tr>
</tbody>
</table>
3.6 Sampling size calculation

• The sample size was determined using the formula:

\[ N = \left( \frac{z_{1-\alpha/2}}{d} \right)^2 p (1-p)/d^2 \]

Where; \( N \) = required sample size

\( z_{1-\alpha/2} = \) confidence level at 95% (standard normal deviation usually set at 1.96)

\( p = \) proportion of retention among PLHIV

\( d = \) degree of margin of error

• The sample size was calculated with the following parameters \( p = 70\% \) or 0.70 ((Lourenço et al., 2016)) literature retention, 95% confidence level (z) and a margin of error (d) of 5% were assumed.

\[ N = (1.96)^2 \times 0.70 \times (0.3) \]

\[ (0.05)^2 \]

\[ 323. \]

Finite population correction factor (n) =\[ n_oN \]
\[ n_o + (N-1) \]

Where \( N \) = PLHIV population at Pantang ART Center =600

\( n_o = \) number of PLHIV retained = 323
\[ n = \frac{600 \times 323}{600 + (323-1)} \]

= 210 participants.

Adjusting for 10% non-response rate, the total sample size collected was 21 + 210 = 231

3.7 Sampling Method

3.7.1 Participant Selection
Convenient sampling was used to recruit participants who receive care at Pantang ART in Accra who met the inclusion criteria. On the day of the sampling, the researcher went to Pantang hospital, all patients available were contacted and those who gave their consent were recruited and interviewed. This was repeated until the desired sample size was met.

3.7.2 Inclusion Criteria
- All HIV positive patients who reported at Pantang hospital clinic for ART within the study period.
- All HIV positive patients who had been referred for treatment at Pantang hospital within the study period.
- HIV patients’ records available at Pantang during the study period

3.7.3 Exclusion Criteria
- Children on ART who were below the age of 16 years were excluded.
- Patients who were severely ill at the time of data collection such that they could not participate in the interview were excluded.
3.8 Data Collection Tool
The study employed two approaches for the data collection, data extraction from patients’ folders and administration of questionnaire.

3.8.2 Medical record extraction
Participants’ medical records were retrieved from the hospital cabinet after they had received medical care for the day. Relevant information such as patients’ socio-demographic data, date and month of HIV test, ART treatment prescribed, WHO clinical stage of disease, recent CD4 counts and date of last hospital visit among other relevant information were extracted.

3.8.3 Questionnaire Administration
After the data extraction, questionnaire were administered to collect data on whether the health facility provides conducive or friendly environment for the patient, any side effects from the antiretroviral drugs, personal challenges such as transportation, difficulty in reaching ART centers presence opportunistic infection, TB screening, Clinical stage of diseases, Funding option, referral information

3.8.4 Data Analysis
• Before the analysis was done, the data was cleaned and all errors and omissions were verified against the original data source. Data was imported into Stata version 15 and labeled appropriately for analysis. The software was used for descriptive statistics of the data for measures of central tendency, measure of variability and graphical representation.
• Frequencies tables were constructed for continuous variables such as age, and categorical variables were presented as percentages.
• Chi-square test was used to test the association between dependent variable and all
  The independent variables and significance was set at p<0.05 with 95% confidence
  interval.

• Multiple logistic regression was used to determine the strength of association between the
  dependent and the independent variables. Adjusted odds ratio was calculated for the
  variable found to have a significant association with the main outcome variable (retention
  in care) at 0.05 significant level and 95% confidence interval, the odds ratios were
  adjusted at the multivariate level to control for confounders or mediators.

• One hundred and ninety two (192) representing approximately 70 % of the PLHIV were
  retained during the study period. Descriptive tables and graphs are provided to describe
  the data in the first section where association study is presented in the remaining section.
  Chi square test was used to conduct test of association for variables that were categorical
  for cases where the minimum frequency in a cell is more than 5 and the fisher exact test
  was used in cases where the frequency in some cells were less than 5. Student t-test was
  used for continuous variables. In the case of the continuous variable, the Shapiro-Wilks
  test of normality was used to ascertain the normality of the assumption for the continuous
  variable and all test was considered significant at 95% confidence level.
3.9 Voluntary withdrawal
Information on voluntary participation and withdrawal from the study at any time without any consequences was explained to the participants. Participants were not compelled to partake in the study and they had a choice of not answering some of the questions, cessation of the interview or not entering the study at all. Participants were informed of any potential discomforts whilst answering some of the questions.

3.9.2 Consenting Process
Signed informed consent were sought from the participants before commencement of the study. Participants were interviewed and their medical records were extracted. The questionnaires were administered to participants after consent form had been signed or thumb printed.

3.9.3 Potential risks/ Benefits
There were no risks associated with participants who took part in the study. However, information gathered from the study will add up to already available knowledge, improve on health interventions of HIV/AIDS patients receiving care and cut down on loss to follow up.

3.9.4 Privacy/ Confidentiality
All data obtained were kept in a locked file cabinet and access limited to only the principal investigator and trained staff. Electronic database was encrypted and restricted to only principal investigator and trained staff.
3.9.5 Quality control
Research assistants were trained on appropriate data collection and data entry methods, to ensure uniformity and accuracy of data collected. Questionnaires were pre-tested before commencement of the study.

3.9.6 Conflict of interest
The principal researcher declared no conflict of interest with respect to the study.

3.10 Ethical Consideration
Ethical clearance was sought from the Ghana Health Service Ethics Review Committee (Number; GHS-ERC 039/12/17) before the study commenced
CHAPTER FOUR

RESULTS

4.1 This section attempts to discuss the results from the analysis of the data. The results is grouped under headings for clarity purposes.

4.2 Descriptive for Demographic variables
The study recruited 289 participant based on the eligible criteria after the consent of the participant were taken. The average age of the respondents was 42 years with a standard deviation (SD) of 10 years. The youngest to be recruited was aged 17 years whereas the oldest was 78 years old. The age distribution looked on visualization as shown in the figure 1.

Table 3 Descriptive statistics for Demographic Variable (n=289)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 24</td>
<td>9</td>
<td>3.1</td>
</tr>
<tr>
<td>Between 25 and 34</td>
<td>48</td>
<td>16.61</td>
</tr>
<tr>
<td>Between 35 and 44</td>
<td>118</td>
<td>40.83</td>
</tr>
<tr>
<td>above 45</td>
<td>114</td>
<td>39.45</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>90</td>
<td>31.14</td>
</tr>
<tr>
<td>Female</td>
<td>199</td>
<td>68.86</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>182</td>
<td>64.31</td>
</tr>
<tr>
<td>Single</td>
<td>61</td>
<td>21.55</td>
</tr>
<tr>
<td>Divorced</td>
<td>25</td>
<td>8.83</td>
</tr>
<tr>
<td>Widowed</td>
<td>15</td>
<td>5.3</td>
</tr>
<tr>
<td>Missing</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Educational Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below JHS</td>
<td>177</td>
<td>61.25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>SHS</td>
<td>88</td>
<td>30.45</td>
</tr>
<tr>
<td>Tertiary</td>
<td>24</td>
<td>8.3</td>
</tr>
</tbody>
</table>

**Occupational Status**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Full time</td>
<td>208</td>
<td>72.73</td>
</tr>
<tr>
<td>Part time</td>
<td>7</td>
<td>2.45</td>
</tr>
<tr>
<td>Self Employed</td>
<td>36</td>
<td>12.59</td>
</tr>
<tr>
<td>Unemployed</td>
<td>35</td>
<td>12.24</td>
</tr>
<tr>
<td>Missing</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Religion**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Christian</td>
<td>25</td>
</tr>
<tr>
<td>Muslim</td>
<td>256</td>
</tr>
<tr>
<td>Other(Traditionalist)</td>
<td>3</td>
</tr>
<tr>
<td>Missing</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td><strong>289</strong></td>
</tr>
</tbody>
</table>

183 (64%) representing majority of the respondents were Diagnostic testing patients followed by PMTCT program representing 53(18%). The patients who had their referral information through Walk in VCT was 27 representing 9% of the respondents. 19 (7%) of the respondents were transferred in on ART whereas 6 of the participants were old patients representing 2%
Figure 3 A distribution of Graph of referral information
Table 4 Health related/Clinical factors (n=289)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HIV Type</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type I</td>
<td>264</td>
<td>97.06</td>
</tr>
<tr>
<td>Type II</td>
<td>4</td>
<td>1.47</td>
</tr>
<tr>
<td>Type I&amp;II</td>
<td>4</td>
<td>1.47</td>
</tr>
<tr>
<td><strong>Screened for TB</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>154</td>
<td>57.46</td>
</tr>
<tr>
<td>No</td>
<td>114</td>
<td>42.54</td>
</tr>
<tr>
<td><strong>TB status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>102</td>
<td>92.73</td>
</tr>
<tr>
<td>Negative</td>
<td>8</td>
<td>7.27</td>
</tr>
<tr>
<td><strong>Initiated TB treatment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>83</td>
<td>95.4</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>4.6</td>
</tr>
<tr>
<td><strong>O I status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>26</td>
<td>9.77</td>
</tr>
<tr>
<td>Negative</td>
<td>240</td>
<td>90.23</td>
</tr>
<tr>
<td><strong>Current Treatment of O I</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotrimoxazole</td>
<td>225</td>
<td>88.58</td>
</tr>
<tr>
<td>Fluconazole</td>
<td>28</td>
<td>11.02</td>
</tr>
<tr>
<td><strong>Medication for other O .C</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>188</td>
<td>70.94</td>
</tr>
<tr>
<td>No</td>
<td>77</td>
<td>29.06</td>
</tr>
<tr>
<td><strong>Past ARV experience</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>235</td>
<td>88.01</td>
</tr>
<tr>
<td>No</td>
<td>32</td>
<td>11.99</td>
</tr>
<tr>
<td><strong>Retention on ART</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retained</td>
<td>192</td>
<td>69.82</td>
</tr>
<tr>
<td>Not retained</td>
<td>83</td>
<td>30.18</td>
</tr>
<tr>
<td><strong>Descriptive statistics for spread of HIV</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DTSP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>93</td>
<td>32.63</td>
</tr>
<tr>
<td>No</td>
<td>192</td>
<td>67.37</td>
</tr>
<tr>
<td><strong>Regular Condom Use</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>149</td>
<td>52.65</td>
</tr>
<tr>
<td>No</td>
<td>134</td>
<td>47.35</td>
</tr>
</tbody>
</table>
O I- Opportunistic Infection

O C- Opportunistic Condition, T.B- Tuberculosis, ARV-Antiretroviral

ART- Antiretroviral therapy, DTSP- Disclosure To Sexual Partner

Thirty-three percent(33%) of the respondents who were sexually active have disclosed HIV status to their sexual partners whereas 192 representing 67% of the sexually active had not disclosed their HIV status to their partners. It can also be seen that 149 representing 53% use condom regularly during sexual intercourse. 116 out of 282 of the respondents had not disclosed their HIV status to their sexual partners and were not using condoms regularly during sexual intercourse.

The distribution of the clinical stage of the participant in the study is presented in Figure 4. The numbers are in descending order with the first clinical stage being the most 135 representing 52% while the fourth clinical stage had the lowest 25 representing 10%.

![Figure 4 Clinical stage of infection (n=289)](http://ugspace.ug.edu.gh)
Stage 1- Acute HIV Infection, Stage 2–Chronic HIV infection, Stage 3-AIDS(CD4 less than 200 cells/ml), Stage 4 –Severe AIDS.

A student t test is conducted to establish whether there is an association between age and retention of PLHIV in care participants. The results is shown in table 5 and from the p-values, it can be concluded that there is a statistical difference in the age of the participant who were retained when compared with the age of the participant who were not retained.

Table 5 Test of difference of age among retention of participants

<table>
<thead>
<tr>
<th>Group</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Err.</th>
<th>Std. Dev.</th>
<th>95% Conf. Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retained</td>
<td>192</td>
<td>41.4688</td>
<td>0.68521</td>
<td>9.4945</td>
<td>40.1172 – 42.8203</td>
</tr>
<tr>
<td>Not retained</td>
<td>83</td>
<td>45.4096</td>
<td>1.20766</td>
<td>11.0023</td>
<td>43.0072 – 47.8121</td>
</tr>
<tr>
<td>Combined</td>
<td>275</td>
<td>42.6582</td>
<td>0.61007</td>
<td>10.1168</td>
<td>41.4572 – 43.8592</td>
</tr>
<tr>
<td>Difference</td>
<td></td>
<td>-3.9409</td>
<td>1.30988</td>
<td>-6.5196</td>
<td>-1.3621</td>
</tr>
</tbody>
</table>

P-value= 0.0439

From table 6, gender had no association with the participants being retained on ART treatment (P-values 0.99). Marital status was found to have an association with the tendency of remaining on ART treatment with a p-value of 0.015. The level of education and religion was found to have no relationship with the tendency of being retained on ART treatment with p-values 0.944 and 0.078 respectively. However, occupation of the respondents was statistically related to the tendency of being retained on ART (P-value <0.05).
Table 6 Bivariate association of Retention on ART and Demographic Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Retained</th>
<th>Not retained</th>
<th>Total</th>
<th>Chi square value</th>
<th>P-values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 24</td>
<td>9</td>
<td>0</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 and 34</td>
<td>29</td>
<td>13</td>
<td>42</td>
<td>0.0448*</td>
<td></td>
</tr>
<tr>
<td>35 and 44</td>
<td>85</td>
<td>29</td>
<td>114</td>
<td></td>
<td></td>
</tr>
<tr>
<td>above 45</td>
<td>69</td>
<td>41</td>
<td>110</td>
<td></td>
<td></td>
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<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Male</td>
<td>60</td>
<td>26</td>
<td>86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>132</td>
<td>57</td>
<td>189</td>
<td>0.0002</td>
<td>0.990</td>
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<td><strong>Marital Status</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>129</td>
<td>44</td>
<td>173</td>
<td>0.015</td>
<td></td>
</tr>
<tr>
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<td>41</td>
<td>17</td>
<td>58</td>
<td>10.4997</td>
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<tr>
<td>Divorced</td>
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<td>12</td>
<td>25</td>
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<td></td>
</tr>
<tr>
<td>Widowed</td>
<td>6</td>
<td>8</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Education Level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below JHS</td>
<td>115</td>
<td>51</td>
<td>166</td>
<td>0.1151</td>
<td>0.944</td>
</tr>
<tr>
<td>SHS</td>
<td>61</td>
<td>26</td>
<td>87</td>
<td></td>
<td></td>
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<tr>
<td>Tertiary</td>
<td>16</td>
<td>6</td>
<td>22</td>
<td></td>
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</tr>
<tr>
<td><strong>Occupation</strong></td>
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<td></td>
</tr>
<tr>
<td>Full time</td>
<td>150</td>
<td>45</td>
<td>195</td>
<td>0.000*</td>
<td></td>
</tr>
<tr>
<td>Part time</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>self-employed</td>
<td>10</td>
<td>25</td>
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</tr>
<tr>
<td>Unemployed</td>
<td>25</td>
<td>10</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Religion</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muslim</td>
<td>20</td>
<td>3</td>
<td>23</td>
<td>0.078*</td>
<td></td>
</tr>
<tr>
<td>Christian</td>
<td>166</td>
<td>78</td>
<td>244</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *P-values means fisher exact test was used on ascertaining the association

Other—Any other religion than either Christianity or Islamic religion.
Table 7 also give the summary of the association between Retention on ART and Health related variables. The Chi squared values and the P-values are given. From table (), type of HIV, weather the participant was pregnant and weather the participant have disclosed their HIV status to their sexual partners were found not to have statistically significant association between participant retention in care with p-values 0.323, 0.675 and 0.881. The chi Squared test revealed that Referral information (P-value <0.05), source of funding (P-value=0.04), weather the participant have tested for Tuberculosis (P-value<0.0 were statistically related to the tendency of the participant being retained on ART for HIV. However, the tendency of the participants being retained in care for those who tested positive for TB were not statistically different from those who tested positive (P-value 0.511). Also, the among the TB positive participants, those on treatment were not statistically different from those who were not on treatment for TB (P-value=0.632). Participant who use condom regularly during sexual intercourse with their partners was found to be statistically different from participant who do not use condom regularly during sex(P-value =0.01). It can also be seen from table 7 that the clinical stage of HIV of participant was associated with retention of participant on ART (P-value=0.021) and the presence of opportunistic infection was associated with retention of participant on ART (P-value= 0.046).
Table 7 Bivariate association of Retention on ART and Clinical characteristics of Patient.

<table>
<thead>
<tr>
<th>Referral Information</th>
<th>Retained</th>
<th>Not retained</th>
<th>Total</th>
<th>Chi square Value</th>
<th>P-values</th>
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<td>Diagnostic</td>
<td>125</td>
<td>50</td>
<td>175</td>
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<tr>
<td>Walk-in VCT</td>
<td>19</td>
<td>7</td>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PMTCT Program</td>
<td>40</td>
<td>8</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Old patient</td>
<td>5</td>
<td>1</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transfer in on ART</td>
<td>3</td>
<td>16</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source of Funding</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Out of Pocket</td>
<td>96</td>
<td>26</td>
<td>122</td>
<td>8.4167</td>
<td>0.004</td>
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<tr>
<td>Sponsored</td>
<td>93</td>
<td>56</td>
<td>149</td>
<td></td>
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<tr>
<td>Type of HIV</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type I</td>
<td>183</td>
<td>68</td>
<td>251</td>
<td></td>
<td>0.609 *</td>
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<tr>
<td>Type II &amp; Type I &amp; II</td>
<td>5</td>
<td>2</td>
<td>7</td>
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<tr>
<td>Testing for TB</td>
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<tr>
<td>Yes</td>
<td>120</td>
<td>24</td>
<td>144</td>
<td>22.1887</td>
<td>0.000</td>
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<tr>
<td>No</td>
<td>64</td>
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<td>TB status</td>
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<td>0.511*</td>
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<td>Negative</td>
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<td>3</td>
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<tr>
<td>Treatment for TB</td>
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<td></td>
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<tr>
<td>Yes</td>
<td>62</td>
<td>17</td>
<td>79</td>
<td></td>
<td>0.632*</td>
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<tr>
<td>No</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presence of O I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>13</td>
<td>12</td>
<td>25</td>
<td>3.9802</td>
<td>0.046</td>
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<tr>
<td>Negative</td>
<td>162</td>
<td>65</td>
<td>227</td>
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<tr>
<td>Pregnant</td>
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<tr>
<td>Yes</td>
<td>186</td>
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<td>261</td>
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<td>0.675*</td>
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<tr>
<td>No</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
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<tr>
<td>DSTP</td>
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<td></td>
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<tr>
<td>Yes</td>
<td>65</td>
<td>26</td>
<td>91</td>
<td>0.0223</td>
<td>0.881</td>
</tr>
<tr>
<td>No</td>
<td>127</td>
<td>53</td>
<td>180</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Regular Condom Use
Yes 113 32 145 6.6166 0.010
No 79 45 124

Clinical Stage
Stage 1 100 28 128 0.021*
Stage 2 32 18 50
Stage 3 29 18 47
Stage 4 22 3 25

Note: *P-values means fisher exact test was used on ascertaining the association


At this point, a binary logistic model is fitted to the factors that were found to be statistically significant with the retention of participant on ART. The results in shown in table 8 marital status, Religion, referral information, source of funding regular condom use were all not statistically significant in terms of association with the retention of participant on ART when information on occupation, screening for TB, clinical stage of HIV and age and the presence of opportunistic infection was accounted for. Participant who were self-employed had 11 folds the odds of being retained in care compared to their counterparts who were fully employed (OR=11.00, CI (2.55-74.71), P-value<0.05). In addition, Participants who have tested for TB have an increased risk of 180% of being retained in care (OR=2.80, CI=1.24-6.65, P-value=0.014) where as an increase in age of participant by one year increases the odds of being retained in care by about 6%. (OR=1.06, CI= 0.07-1.74, P-values 0.013). Participants who were at the first clinical stage of HIV had three times the odds of being retained on ART compared to participant at the second clinical stage of HIV. The absence of Opportunistic infection in a
participant reduces the odds of being retained in care by about 69% (OR= 0.03, CI=0.09-1.00 p-value=0.051).

### Table 8 Results of Logistic regression for factors affecting Retention on ART

| Retention on ART     | Odds Ratio | Std. Err. | P>|z| | [95% Conf. Interval] |
|----------------------|------------|-----------|-----|----------------------|
| Marital Status       |            |           |     |                      |
| Married (ref)         |            |           |     |                      |
| Single               | 1.83385    | 0.96036   | 0.247| 0.65705              |
| Divorced             | 1.170691   | 0.80576   | 0.819| 0.30379              |
| Widowed              | 4.656779   | 4.62874   | 0.122| 0.66376              |
| Occupation           |            |           |     |                      |
| Full time (ref)       |            |           |     |                      |
| Part time            | 0.539346   | 0.82468   | 0.686| 0.02694              |
| self-employed        | 11.04429   | 8.24501   | 0.001| 2.55671              |
| Unemployed           | 1.069238   | 0.68388   | 0.917| 0.30525              |
| Religion             |            |           |     |                      |
| Muslim (ref)          |            |           |     |                      |
| Christian            | 2.1354     | 1.7767    | 0.362| 0.41808              |
| Other                | 1 (empty)  |           |     |                      |
| Referral Information |            |           |     |                      |
| Diagnostic (ref)      |            |           |     |                      |
| Walk-in VCT          | 1.304363   | 0.82209   | 0.673| 0.37924              |
| PMTCT Program        | 1.61724    | 1.14371   | 0.497| 0.4044               |
| Old patient          | 1 (empty)  |           |     |                      |
| Transfer in funding option | 3.083622 | 3.07666 | 0.259 | 0.4363 | 21.7942 |
| Sponsored            | 1.196044   | 0.49951   | 0.668| 0.52754              |
| Funding option       |            |           |     |                      |
| Self-sponsored       |            |           |     |                      |
| Tb screening         |            |           |     |                      |
| No                   | 2.871297   | 1.22969   | 0.014| 1.24032              |
| Yes                  |            |           |     |                      |
| Presence of O. I     |            |           |     |                      |
| Positive             |            |           |     |                      |
| Negative             | 0.307451   | 0.18574   | 0.051| 0.09409              |
| Regular condom Use   |            |           |     |                      |
| Yes                  | 1.815076   | 0.78474   | 0.168| 0.77783              |
| No                   |            |           |     |                      |
| Clinical stage of patient |  |           |     |                      |
| Stage 2              |            |           |     |                      |
| Stage 1              | 3.169686   | 1.76181   | 0.038| 1.06633              |
| Stage 3              | 1.737774   | 0.89199   | 0.282| 0.63544              |
| Stage 4              | 0.337007   | 0.28246   | 0.194| 0.0652               |
| Age                  | 1.058269   | 0.02419   | 0.013| 1.0119               |

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CHAPTER FIVE

DISCUSSION

This study has revealed that, the overall retention of PLHIV at Pantang ART clinic was 70%.

Age, occupation (self-employed), clinical stage of disease, presence of opportunistic infection and TB screening were associated with retention in care among PLHIV at Pantang ART clinic. The 70% retention in this study is in agreement with the 71%-95% retention reported in other resource limited settings in 2018 (Abuogi et al., 2016). However, lower rates have also been reported in Nigeria, the interaction rates reported was 63% as reported by Babatunde, et al., 2015.

This study also demonstrated that retention was high among 35 years and above age group. However, this is inconsistent with previously published work which found out that as the age of a PLHIV increases, retention decreases (Lourenço et al., 2016) this contrast in results may be due to the differences in the population recruited for the various studies. Again this difference in the finding may be attributed to the fact that, majority of the respondents in our study constituted the age group of 35 and above (40.8%).

The results of this study also revealed that of the patients who were retained in care, majority of them were either married or single. This finding agrees with a study in Zimbabwe, which indicated that most of the PLHIV who were retained in care were married or had been married before (Mutasa et al., 2014). However, after controlling for possible confounders, there was no significant association between marital status and retention in care.

In Haiti, Hennessy et al., reviewed records of a total of 4109 PLHIV from march 2003 to February 2013 and found that married or cohabiting living status was significantly associated with retention in care(Hennessey et al., 2017).
Interestingly being self-employed was found to be associated with increased retention, in this study. We speculate that, those who are self-employed might have higher retention rates due to the nature of their job which permits them to adhere to appointment schedule without fear of losing one’s job or being scorned for being late for work. In addition, this group are able to cater for their medical bills as compared to those who are working for others (Government or other employers). This occurrence is supported in part by the revelation that, majority of the respondents who paid for their medical bills out of pocket were more retained, although this finding was not statistically significant.

This finding is similar to the report of a 10 year prospective cohort study in Uganda that found that unemployment may be a risk factor for long term ART outcomes and a significant relationship was identified between self-employment and lower incidence of mortality and retention after controlling for known confounding covariates such as physical disability (Flynn et al., 2017).

Absence of opportunistic infection in a participant in this study reduces the odds of being retain in care by about 69%. Some studies done across Africa have reported that causes including mycobacterial, neurologic infections, malnutrition/anemia, drug toxicity, immune-reconstitution inflammatory syndrome (IRIS), and septicemia related to AIDS and other opportunistic infections were related to degree of retention and attrition (Mekuria, Prins, Yalew, Sprangers, & Nieuwerkerk, 2015).

This current study also reveals that individuals who had screened for TB were more likely to be retain in care compared to those who never had screening for TB and this association was statistically significant. This finding might be associated with the fact that, after TB screening, PLHIV become more conscious of their health and thus make conscious efforts to be consistent
in seeking care. This is similar to findings reported in Zimbabwe in 2016 by Matyanga and his colleagues that stated, TB screening among PLHIV leads to improved retention (Matyanga et al., 2016).

Our study revealed that clinical stage of HIV was associated with retention of participants in care and that being in WHO clinical stage 1 was associated with improved retention as compared to the other stages of the infection.

We speculate that, this observation may be attributed to the fact that, as PLHIV progress from clinical stage 1 to clinical stage 2 they are motivated to make conscious efforts in order to achieve significant viral load suppression and to further prevent complications associated with the disease.

In a Zimbabwe’s national anti-retroviral therapy program records of PLHIV from 2007 to 2009 was reviewed, attrition was found to be highest amongst WHO clinical stage four (4) patients compared to those in WHO clinical stage one (1) or two(2) (Mutasa-Apollo et al., 2014).

In this study, the findings revealed that, majority of the respondents who paid for their medical bills out of pocket were more retained than those who had an insurance cover.
CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion
The retention of people living with HIV/AIDS receiving care at Pantang hospital during the study period (2012-2017) was relatively high (70%). Age, self-employment, TB screening, opportunistic infection and WHO clinical stage 1 of the disease were the demographic and health related factors that had a significant association with retention in care at the Pantang ART clinic.

6.2 Recommendations
From the findings of this research, the under listed recommendations are made:

I. Patients should be linked to care immediately after HIV diagnosis.

II. All antiretroviral therapy (ART) centers should be equipped with the necessary reagent and equipment to render comprehensive care for HIV/AIDS patients.

6.3 Limitations

1. The issue of generalizability. Because the study was conducted at a single ART site (Pantang ART center), it clearly indicates that, findings cannot be generalized to other ART centers/clinics or nationally.

2. Causal inference could not be ascertained because exposure and disease were determined at the same point in time.

6.4 Future Research
Inclusion of a significant number of ART sites and exploitation of many factors proposed by literature in attempts to make findings more generalizable.
REFERENCES


diagnosis to engagement in HIV care: Assessment and predictors of linkage and retention in care among patients diagnosed by emergency department based testing in an urban public hospital. *AIDS Patient Care and STDs*, 28(6), 277–279. https://doi.org/10.1089/apc.2014.0052


APPENDICES

APPENDIX A

ID: ............................................

Abstraction date: ............................................

Patient Identification

1. Patient’s ID code:
   .................................................................................................................................
   ........................................

2. Date of Birth:
   .................................................................................................................................
   ........................................

3. Age: ............................

4. Gender:
   □ Male
   □ Female

5. Marital Status
   □ Married
   □ Single
   □ Divorced
   □ Separated
   □ Widow (er)
   □ Cohabiting

6. Educational Level
   □ Nil
   □ Primary
   □ JHS
   □ SHS/Tech
   □ MSLC
□ Tertiary

7. Occupation
□ Full time
□ Part time
□ Self employed
□ unemployed

8. Religion
□ Muslim
□ Christian
□ Traditional
□ Other
□ none

9. Referral Information
□ Diagnostic testing
□ Walk-in VCT site
□ PMTCT Program
□ Old patient
□ Transfer in on ART
□ Transfer in from paediatric
□ From TB program
□ STI testing

10. Funding Option
□ Out of pocket
□ Medical insurance
□ Special project
□ Employer sponsored

Clinical Care

11. Date of HIV test: ........................................

12. HIV type
□ HIV I
□ HIV II
☐ HIV I & HIV II

13. TB screening
   ☐ Yes
   ☐ No

14. If yes for 13…TB result
   ☐ Positive
   ☐ Negative

15. TB treatment initiated
   ☐ Yes
   ☐ No

16. Presence of opportunistic infections
   ☐ Positive
   ☐ Negative

17. Current opportunistic infection medication
   ☐ Cotrimoxazole
   ☐ Fluconazole
   ☐ TB treatment

18. Medication for other conditions
   ☐ Yes
   ☐ No

19. Medication Name:
    ...........................................................................................................

20. Past ARV experience
   ☐ Yes
   ☐ No

21. If yes in (20), Drugs and Dates
   i. Drug:
      ...........................................................................................................
      .... Duration: .............
ii. Drug:
........................................................................................................................................
.... Duration: .............

iii. Drug:
........................................................................................................................................
.... Duration: .............

**Pregnancy information**

22. Pregnant?
........................................................................................................................................

23. Duration: ......................

24. Expected delivery date: ....................

25. ARV prophylaxis for PMTCT

☐ Yes
☐ No

26. If yes in 25, date started.........................................................

27. Symptom Screen (e.g. Jaundice)

i. Symptom ...............................................................  

ii. Symptom .............................................................

iii. Symptom ............................................................

iv. Symptom ............................................................

28. If sexually active, disclosure to sexual partner?

☐ Yes
☐ No

29. If sexually active, regular condom use?

☐ Yes
☐ No

30. WHO clinical stage of patient

☐ Stage 1
Stage 2
Stage 3
Stage 4

**CD4 test information**

31. Baseline CD4 count: .................................................................
32. Baseline test Date: .................................................................
33. Second CD4 count: .................................................................
34. Date of second CD4 count: ....................................................
35. Third CD4 count: .................................................................
36. Date of third CD4 count: .......................................................  
37. Fourth CD4 count: .................................................................
38. Date of fourth CD4 count: .....................................................
39. Most recent CD4 count............................................................
40. Date of most recent CD4 count..........................

41. Is Patient recommended for ART treatment
   - Yes
   - No

42. If yes for 41 was adherence counselling done?
   - Yes
   - No

43. Is Patient on ART?
   - Yes
   - No

**ARV treatment and Adherence**

44. Date of last visit: ..........................

45. Number of ARV doses missed since last visit: ..................

**ARV status of patient**

46. Start date: ..........................................................
47. Patient length of time on continues use ART

☐ Between 1 to 3 months
☐ Between 3 to 6 months
☐ Between 6 to 9 months
☐ Between 9 to 12 months
☐ For more than 12 months
☐ discontinued ART completely

48. If ART discontinued, what was the reason?

........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................

ARV treatment prescribed

49. First line ARV drugs

First choice

☐ AZT+3TC+NVP
☐ AZT+3TC+EFV

Second choice

☐ TDF+3TC+NVP
☐ TDF+3TC+EFV
☐ TDF+FTC+NVP
☐ TDF+FTC+EFV

50. Second line ARV drugs

First choice

☐ TDF+FTC+LPV/r
☐ TDF+3TC+LPV/r
☐ TDF+FTC+ATV/r
☐ TDF+3TC+ATV/r

Second choice

☐ AZT+3TC+LPV/r
AZT+3TC+ATV/r
APPENDIX B

INTERVIEW GUIDE

Topic: Factors associated with retention in care among HIV/AIDS patients receiving Antiretroviral therapy (ART) at the Pantang ART Center Accra.

Extraction date: ………………………………………

Interview questinaire for patients receiving care at Pantang ART center

Health insurance access

1. During the past 12 months, have you had any kind of health insurance or health coverage?
   a. No ................................................................. ☐ 0
   b. Yes ................................................................. ☐ 1
   c. Refused to answer ............................................. ☐ 7
   d. Don’t know ...................................................... ☐ 8

work_status

2. Are you currently…? (Work)
   a. Employed for wages ........................................... ☐ 1
   b. Self-employed .................................................. ☐ 2
   c. Out of work for more than 1 year .......................... ☐ 3
   d. Out of work for less than 1 year ............................ ☐ 4
   e. A Homemaker .................................................. ☐ 5
   f. A Student .......................................................... ☐ 6
   g. Retired ............................................................. ☐ 7
   h. Or unable to work ............................................ ☐ 8
   i. Refused ........................................................... ☐ 9

first_positive_result

3. What month and year did you first test positive for HIV? Tell me when you got your result, not when you got your test.
   a. __ __/ __ __ __ __
   b. (M M / Y Y Y Y )

4. When you tested positive in __ __/ __ __ __ __ [INSERT DATE], at what type of facility were you tested?
   a. Private doctor’s office ...................................... ☐ 1
   b. Primary care clinic or community health center ............ ☐ 2
   c. Health department .......................................... ☐ 3
   d. Labor/delivery setting ........................................ ☐ 4
   e. OB-GYN or family planning clinic ........................... ☐ 5
   f. Emergency room ............................................. ☐ 6
   g. Inpatient hospital (not labor/delivery or emergency room) ... ☐ 7
   h. HIV counseling and testing site .......................... ☐ 8
i. STD clinic ................................................................. 9
j. HIV/AIDS infectious disease clinic ............................. 10
k. Mobile test site ...................................................... 11
l. Correctional facility ............................................... 12
m. Blood donation facility ........................................... 13
n. Substance abuse treatment center ............................. 14
o. Insurance or employee clinic .................................... 15
p. Other (Specify:______________________________) ....... 16
q. Refused to answer ................................................... 77
r. Don’t know ............................................................. 88

5. When you tested positive in ___ / ___ ___ ___ [INSERT DATE], what was the main reason you were tested?
   a. Concerned about exposure through sexual contact .......... 1
   b. Concerned about exposure through IDU ..................... 2
   c. Part of STD screening or due to STD diagnosis .............. 3
   d. Due to other illness (not STD) .................................... 4
   e. Due to pregnancy .................................................... 5
   f. Personal initiative to routinely test .............................. 6
   g. Provider recommendation as part of routine care......... 7
   h. Health department partner notification (PCRS) ............ 8
   i. Before blood donation .............................................. 9
   j. Needle stick follow-up or occupational exposure .......... 10
   k. Requirement (military, court order, or insurance) .......... 11
   l. Other (Specify:______________________________) .......... 12
   m. Refused to answer ................................................... 77
   n. Don’t know ............................................................. 88

   **first_doctor_visit**

6. Since testing positive for HIV, what month and year did you **first** visit a doctor, nurse, or other health care worker for HIV medical care?
   a. ___ / ___ ___ ___
   b. (M M / Y Y Y Y )

   **recent_doctor_visit**

7. When was your **most recent** visit to a doctor, nurse, or other health care worker for HIV medical care? Please tell me the month and year.
   a. ___ / ___ ___ ___
   b. (M M / Y Y Y Y )

8. What was the main reason you didn’t have a usual place to get HIV medical care during the **past 12 months**?
a. Couldn’t afford a usual source of HIV care ........................................□□1
b. Didn’t know where to find a usual source of HIV care .................□□2
c. Couldn’t get regular appointments anywhere ................................□□3
d. It wasn’t available in the area ................................................................□□4
e. Didn’t think it was necessary .................................................................□□5
f. Thought it was necessary, but never tried to get a usual source of care ........................................................................................................□□6
g. Other (Specify: ______________________________) .........................................................................................................................□□7
h. Refused to answer ........................................................................................□□7
i. Don’t know ................................................................................................□□8

9. Do you have a person you think of as your HIV doctor, nurse, or other healthcare provider?
   a. No ........................................................................................................................................................................□□0
   b. Yes .........................................................................................................................................................................□□1
   c. Refused to answer ........................................................................................................................................□□7
   d. Don’t know ........................................................................................................................................................□□8

10. You are dissatisfied with some things about the HIV medical care you receive.
    a. Strongly agree ....................................................................................................................................................□□1
    b. Agree .................................................................................................................................................................□□2
    c. Uncertain ............................................................................................................................................................□□3
    d. Disagree ..............................................................................................................................................................□□4
    e. Strongly disagree ................................................................................................................................................□□5
    f. Refused to answer .................................................................................................................................................□□7
    g. Don’t know ........................................................................................................................................................□□8

11. In the past 12 months, between [ONE YEAR PRIOR TO INTERVIEW DATE] and today, how many times did you go to your HIV doctor or other care provider at [USUAL SOURCE OF CARE FACILITY NAME] for any sort of care?
    a. ______
       how_many_facility_visit

12. Between [INSERT START DATE] and [INSERT END DATE], at how many facilities besides [INSERT NAME OF FACILITY] have you received HIV medical care?

13. During the past 12 months, was there one usual place, like a doctor’s office or clinic, where you went for most of your general medical care?
    a. No ...........................................................................................................................................................................□□0
    b. Yes .........................................................................................................................................................................□□1
    c. Refused to answer ...............................................................................................................................................□□7
    d. Don’t know ........................................................................................................................................................□□8
14. Was your usual place of general medical care the same as your usual place of HIV care?
   a. Medical care?
      b. No ................................................................. □ □ 0
      c. Yes ................................................................. □ □ 1
      d. Refused to answer ........................................... □ □ 7
      e. Don’t know ..................................................... □ □ 8

15. During the past 12 months, were you enrolled in an inpatient mental health facility?
   a. No ................................................................. □ □ 0
   b. Yes ................................................................. □ □ 1
   c. Refused to answer ........................................... □ □ 7
   d. Don’t know ..................................................... □ □ 8

   During the past 12 months, did you get?

16. HIV case management services
   • No ........................................................................ □ □ 0
   • Yes ................................................................. □ □ 1
   • Refused to answer ........................................... □ □ 7
   • Don’t know ..................................................... □ □ 8

17. Counseling about how to prevent the spread of HIV
   • No ........................................................................ □ □ 0
   • Yes ................................................................. □ □ 1
   • Refused to answer ........................................... □ □ 7
      Don’t know ..................................................... □ □ 8

18. Professional help remembering to take your HIV medicines on time or correctly
   • No ........................................................................ □ □ 0
   • Yes ................................................................. □ □ 1
   • Refused to answer ........................................... □ □ 7
   • Don’t know ..................................................... □ □ 8

19. HIV peer group support
   • No ........................................................................ □ □ 0
   • Yes ................................................................. □ □ 1
   • Refused to answer ........................................... □ □ 7
      Don’t know ..................................................... □ □ 8
20. During the **past 12 months**, have you taken antiretroviral medicines?
   a. No ...........................................................................................................☐☐0
   b. Yes .............................................................................................................☐☐1
   c. Refused to answer ......................................................................................☐☐7
   d. Don’t know ...............................................................................................☐☐8

21. During the **past 12 months**, what were the ways your antiretroviral medicines were paid for?
   a. Private health insurance .............................................................................☐☐1
   b. An AIDS service organization provided medicines ....................................☐☐2
   c. Got medicines at a public clinic ..................................................................☐☐3
   d. Clinical trial or drug study provided medicines .............................................☐☐4
   e. Paid for medicines out of pocket ..................................................................☐☐5
   f. Other 1 *(Specify: _____________________________)* .....................................☐☐77
   g. Other 2 *(Specify: _____________________________)* .....................................☐☐88

22. During the **past 12 months**, did your doctor or other clinic staff ask you whether you missed taking any doses of your antiretroviral medicines or if you had difficulty taking your antiretroviral medicines?
   a. No ...........................................................................................................☐☐0
   b. Yes .............................................................................................................☐☐1
   c. Refused to answer ......................................................................................☐☐7
   d. Don’t know ...............................................................................................☐☐8

23. **ever** _had_cd4_test_

24. Have you **ever** had a CD4 test?
   a. No ...........................................................................................................☐☐0
   b. Yes .............................................................................................................☐☐1
   c. Refused to answer ......................................................................................☐☐7
   d. Don’t know ...............................................................................................☐☐8

25. **first_cd4_count**

26. What was the month and year of your **first** CD4 count?
   a. ___/___ __ ___ ___
27. result_date\_most\_recent\_cd4\_count

28. What was the month and year of your most recent CD4 count?
   a. ______/_______
   b. (M M / Y Y Y Y)
   c. Refused to answer .................................................................☐☐7
   d. Don’t know .............................................................................☐☐8

29. result\_most\_recent\_cd4\_count

30. What was the result of your most recent CD4 count?
   a. 0–49......................................................................................☐☐1
   b. 50–99...................................................................................☐☐2
   c. 100–199.................................................................................☐☐3
   d. 200–349.................................................................................☐☐4
   e. 350–499................................................................................☐☐5
   f. 500 or more .........................................................................☐☐6
   g. Refused to answer .................................................................☐☐7
   h. Don’t know .............................................................................☐☐8

31. how\_many\_cd4\_counts\_had

32. During the past 12 months, how many CD4 counts have you had?
   a. _____
   b. Refused to answer .................................................................☐☐7
   c. Don’t know .............................................................................☐☐8

   DV ever\_had\_hiv\_viral\_load\_test

33. Have you ever had an HIV viral load test?
   a. No ...........................................................................................☐☐0
   b. Yes ...........................................................................................☐☐1
   c. Refused to answer .................................................................☐☐7
   d. Don’t know .............................................................................☐☐8

   DW date\_most\_recent\_viral\_load

34. What was the month and year of your most recent viral load?
   a. ______/_______
   b. (M M / Y Y Y Y)
   c. Refused to answer .................................................................☐☐7
   d. Don’t know .............................................................................☐☐8

   DX result\_most\_recent\_viral\_load\_test
35. What was the result of your most recent viral load test?
   a. Below the level of detection, undetectable .......................... □ □ 1
   b. Detectable but less than 5,000 viral copies/ml .................. □ □ 2
   c. 5,000 to 100,000 viral copies/ml .................................. □ □ 3
   d. Greater than 100,000 viral copies/ml ............................... □ □ 4
   e. Refused to answer ...................................................... □ □ 7
   f. Don’t know .................................................................. □ □ 8

DY how_many_viral_load_tests_had

36. During the past 12 months, how many viral load tests have you had?
   a. ____ ____
   b. Refused to answer ...................................................... □ □ 7
   c. Don’t know .................................................................. □ □ 8

37. Is your place of residence far from the ART center? Yes/No

38. Do you have difficulties getting transportation to ART center? Yes/No

   a. Clinical Care

39. Date of HIV test: ......................................................

40. Past ARV experience. Yes/No

41. If yes in (14), Drugs and Dates

42. If sexually active, disclosure to sexual partner? Yes / No

43. If sexually active, regular condom use? Yes / No

Patient’s satisfaction

44. How do you see the services rendered at this facility?
   □ a. Good
   □ b. Satisfactory
   □ c. Poor

45. Is there a constant supply of your needed ARV drugs?
   □ a. Yes
b. No

□ c. Sometimes

46. Is the environment conducive for you the patient based on how the health worker treats you during your treatment session? Yes/No

47. Does the facility ensure privacy when you come around for counselling/ ART? Yes/No/Sometimes

48. Does the facility provide appointment reminders? Yes/ No

49. During the **past 12 months**, how many times have you **missed treatment or appointment**?

   a. Never missed……………………………………………………………0
   b. Once……………………………………………………………1
   c. Twice…………………………………………………………………2
   d. Thrice…………………………………………………………………3

50. What was your reason for missing treatment/appointment(specify)

   …………………………………………………

   **Social support**

51. Difficulty finding transportation to service providers/the facility? Yes/ No

52. My family members, friends and co-workers have been supportive from the day I was diagnosed as HIV positive. Yes/No

53. Do you have any personal or family issues you would like to share? Yes/No

   a. Waiting time

54. Do you wait for longer period before you are being attended to?

   a. Yes /No/Sometimes

55. Do you sometimes miss other appointment at the expense of seeking treatment? Yes/No/Sometimes, if yes to 47

56. Does this sometimes make you feel like not coming for treatment? Yes/No

57. Have you ever felt like stopping treatment in the past one 12 months?

   □ □ a. Yes
   □ □ b. No
58. If yes what was your reason in 98?(Specify)
   a. .................................

59. If no, what is your motivation to continue seeking care at this facility?(Pantang Hospital)
   a. .................................

60. Have you at a point stopped treatment in the past 6 months to seek for care elsewhere?
    Yes/NO

61. If yes, where did you go to seek care afterwards?

   □ Different hospital

   □ Church (from a pastor)

   □ Mosque (from a mallam)

   □ Spiritualist or herbal medicine
APPENDIX C

Consent Form

INFORMED CONSENT FORM

Background

Dear Respondent,

I am Abdallah Safia Raabo, a student of the School of Public Health, University of Ghana, Legon. I am conducting a research on the topic: Factors associated with retention in care among Patients receiving antiretroviral therapy at Pantang hospital, Ghana.

All information given or extracted from your patient records shall be kept confidential. Your participation and consent is highly beneficial however, you can refuse to take part in the interview or give consent for information to be extracted from patient folder. You may opt out of the study at any stage if you wish and this will attract no penalties or loss of medical benefit. No monetary incentives will be given in this research. Extracted information will be coded and identities of participants kept confidential to all who handle the data except the principal investigator.

Thank you for your cooperation.

Signed

(Principal investigator)
Dear Principal investigator,

I have read the foregoing information. I have had the opportunity to ask questions about it and all questions I have asked have been answered to my satisfaction. I consent voluntarily to participate as a subject in this study and understand that I have the right to withdraw from the study at any time without in any way it affecting my further medical care.

Signed                                                           Thumb print

……………………….                                          …………………………….
(Research participant)  (Research participant)

Signed

……………………..
(Witness)

Respondents / participants only:
On my own accord, based on my understanding of what the study entails, hereby consent to be part of the study.

[ ] Please check box if you consent to partaking in the interview.

Sign/Thumbprint………………. Witness’s Sign………………………….
Date………………………….. Date…………………………………….
Name of Researchers: ………………………………………………………..