

**UNIVERSITY OF GHANA  
COLLEGE OF HUMANITIES**

**PREDICTORS OF MEDICATION ADHERENCE: A STUDY AMONG PEOPLE  
LIVING WITH HIV (PLWHIV) IN THE ASHANTI REGION OF GHANA**

**BY**

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## DECLARATION

I hereby declare that except for the references to other people's work, which have been duly acknowledged, the study presented here was written by me, under the supervision of Dr. Joana Salifu Yendork and Dr. Enoch Teye-Kwadjo. It is a record of my own research work and has not been previously presented in any form whatsoever in any application for a Degree elsewhere. All sources of information collected and materials used have been duly acknowledged by means of references.

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## **DEDICATION**

I dedicate this work primarily to the Almighty God for His Guidance and Mercy throughout my studies. I also dedicate this work to my dear wife Evelyn Ansah Fosu and my lovely son Morrison Nana Kwame Fosu for the support, love and care you have given me all this time.

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## ABSTRACT

Based on the importance of strict medication adherence needed to achieve significant viral suppression and good clinical outcome in HIV patients, continuous investigations into factors that predict adherence have always been considered necessary due to the global threat the virus poses. The present study aimed at investigating predictors of medication adherence among PLWHIV in the Ashanti Region, Ghana. This study specifically investigated how factors such as HIV stigma, spirituality, self-efficacy, doctor's communication skills and perceived social support each predict medication adherence among PLWHIV. The study used 349 PLWHIV from the Ashanti Region of Ghana. Standard Multiple Regression was used to test the relationship between HIV-related stigma, spirituality, self-efficacy, doctor's communication skills, perceived social support and HIV medication adherence. Gender difference in medication adherence was also tested using Independent Samples t-test. Findings from the study revealed that doctor's communication skills and perceived social support from significant other each had a positive relationship with HIV medication adherence. HIV-related stigma, general self-efficacy, and spirituality each had a negative relationship with medication adherence. There were no significant differences between men and women in HIV medication adherence. These findings suggest that healthcare providers in HIV management including physicians and psychologists should improve their communication skills as this has been shown to promote medication adherence.

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## **LIST OF ABBREVIATIONS**

MOH – Ministry of Health

PLWHIV – People Living With Human Immunodeficiency Virus

HIV – Human Immune Virus

AIDS – Acquired Immunodeficiency Syndrome

CD4 – Cluster of Differentiation 4

HAART – Highly Active Antiretroviral Therapy

ARV - Antiretrovirals

## CHAPTER ONE

### INTRODUCTION

#### 1.0 Background of the study

The Human Immunodeficiency Virus (HIV) infection leads to Acquired Immunodeficiency Syndrome (AIDS) after it has done enough damage to the immune cell of a person. The virus attacks a particular type of immune cells known as the T-lymphocyte cells, which is also called T-helper or CD4 cells (Ankrah, Lartey, Agyepong, Leufkena, & Mantel-Teeuwiasse 2015; Boakye, 2015; World Health Organisation, 2010). These CD4 cells play a vital role when it comes to the body's immune cells response to a particular foreign body invasion as it coordinates all the other immune cells to fight against the infection (Boakye, 2015). The HIV virus has the potential to enter into the cytoplasm of these cells, and hijack the body's mechanism to replicate and force the affected cells to undergo apoptosis (programmed cell death) (World Health Organisation, 2010). As the CD4 cells in the body become more and more depleted, the body loses its ability to fight infections. This leads to a high incidence of opportunistic infections as bacteria takes advantage of the immunocompromised state of the body to cause harm. Opportunistic infections are the number one cause of disability and death among patients with HIV (Ankrah et al., 2015; Boakye, 2015).

People with HIV infection first go through the window period. This is the period from infection of HIV until when a test will prove positive for the virus. From the window period, they go to the asymptomatic phase. Human Immune Virus test at this stage can prove that the person is positive but the person may show no sign of HIV infection. The person from the asymptomatic phase then moves to the symptomatic phase, which consists of four main stages,

with stage one having the less severe symptoms and stage four having the severest symptoms (World Health Organisation, 2010). The virus can live in the human body for a number of years and may be transmitted to others before any symptoms develop (Ghana Aids Commission, 2010). The virus can be passed on from an infected individual to another mainly through sexual intercourse, transfusion with infected blood, infected mother to child, using infected needles or sharp objects (Ministry of Health, 2009).

Worldwide, about 36.9 million people were infected with the virus at the close of 2017 (United Nations Programme on HIV/AIDS, 2018). Out of this, 18.2 million were women aged 15 years and above, 1.8 million were children below the age of 15 years (UNAIDS, 2018). In 2017 alone, 1.8 million newly infected cases were recorded., out of which 180,000 were children below age 15 years. (UNAIDS, 2018). Estimates of 940,000 death related to AIDS were recorded in 2017 of which 110,000 were children below the age 15 years. Approximately 5000 HIV infections (adult and children) were recorded in a day of which 66% were in sub-Saharan Africa.

In Ghana, 19,000 new infections with the virus were estimated to have occurred in 2017 according to a UNAIDS report (UNAIDS, 2018). About 16,000 deaths were recorded in the year and approximately 310,000 people were diagnosed with the virus across the various age groups (UNAIDS, 2018). The 2016 Sentinel Survey recorded an HIV prevalence rate of 2.4% in Ghana. As part of efforts to reduce mortality rates among HIV infected persons, the option B+ which involves starting antiretroviral therapy irrespective of the patient's CD4 count, the 90-90-90 policy which means that 90% of individuals with HIV should be aware of their status, 90% should be placed on antiretroviral therapy, and 90% should achieve a viral suppression were also adopted in Ghana in addition to the scaling-up of antiretroviral medications (UNAIDS, 2018).

The number of people who were taking Highly Active Antiretroviral Therapy (HAART) as at 2003 have increased significantly from 0.4% to 47.4% as at 2012 (Ghana Aids Commission, 2014). Wang et al. (2004) found an association between antiretroviral medication adherence and improved quality of life among individuals living with HIV/AIDS. Other studies have also reported a relationship between antiretroviral medication adherence and patient outcomes such as a decrease in the incidence of opportunistic infections (Bengsberg & Machtinger, 2005), and a decrease in hospital readmissions and cost among others (Wools-Kaloustian et al., 2006).

HAART which is the combination of three antiretroviral medications is the treatment of choice in HIV (Obirikorang, Selleh, Abledu & Fofie, 2013). The medications are classified into four main types; these are the (a) Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTI), (b) Nucleoside/tide Reverse Transcriptase Inhibitors (NRTI), (c) Integrase Inhibitors (INSTI) and (d) Protease Inhibitors (PI) (Guidelines for Antiretroviral Therapy in Ghana, 2016; World Health Organisation, 2010). The HIV patient is either placed on two drugs from the NRTI group and one from NNRTI, PI or INSTI group depending on factors such as type of HIV infection (Type 1, 2 or co-infection), previous exposure to ARVs or infection with resistance virus and general medical condition (World Health Organisation, 2010; Ministry of Health 2016)

The antiretroviral medication was introduced in Ghana in 2003 and the major obstacle to antiretroviral treatment is reported to be non-adherence to the treatment plan (Obirikorang et al., 2013). Steiner and Ernest (2000) defined medication adherence as how a patient takes prescribed medication as per the instruction of the Health Care Provider (HCP). According to Boggs (2007), adherence involves complementary actions taken to comply with intervention as well as recommendations that are distinct from other behavioural change outcomes. It is estimated that at

least 95% of ART medications adherence is needed to achieve maximal viral load suppression and to bring down the rate of opportunistic infections (Haas, 2016; Turner, 2002).

The reasons for non-adherence and factors to enhance adherence among HIV patients have been a topic of interest to researchers all over the world. Some of the factors identified by these researchers to be related to adherent behaviour included; self-efficacy (Proeschold-Bell et al., 2013; Shay, 2008). Self-efficacy, an idea explained by Bandura proposes that albeit social cognitive theories recognizes that information on health risk and benefits of treatment are important to perform health behaviours, this in itself isn't sufficient. Patient's self-efficacy is important to accomplish essential changes that will bring about the ideal health conduct (Bandura 2004). It depicts the faith in one's capacity to assume responsibility for behaviours and the certainty that one can play out a particular assignment. Self-efficacy has become a significant focus area during the time spent evaluating patient performance of specific aptitudes that are required to deal with their disease condition, with the point of improving their personal satisfaction. Self-efficacy theory has been recognized as an important tool in health behaviours and has been accepted in social cognitive theory. People with high self-efficacy or self-assurance that they can play out certain health behaviours, for example, holding fast to drug are bound to do such behaviours (Redding et al., 2000).

Social support (Obirikorang et al., 2013; Sabate, 2003), These authors are of the view that social support is very important in people who have a long-term disease like HIV. This is so in the sense that social support provides strength for these people in times of weakness or when they feel like giving up. For HIV patients, social support will be very important considering how they are discriminated against by society. Social support can take different forms; Emotional support, which is the offering of empathy, love, affection, acceptance and encouragement. Tangible support is another form of social support that deals with the provision of material goods, financial assistance or services to a person in need. Informational support deals with providing guidance, advice or useful information to someone. Lastly, companionship support is the type of support that offers a sense of belonging to someone. This support could come from our own family members like mothers, fathers, spouses and even children or friends as well as significant others in our lives.

A good doctor–patient relationship is a vital motivating factor for adhering to drug therapies (Portelli et al., 2012). Factors such as the patient’s trust in the clinic and provider as well as overall satisfaction; communication quality and clarity, the patient’s perception of the provider’s competency; compassion, the provider’s willingness to include the patient in the decision-making process, the adequacy of referral and convenience of visiting the doctor have been identified as strengthening patient-health care provider relationships (Chesney, 2000; WHO, 2003; Portelli et al., 2012). Sullivan et al. (2000) observed that patients' perceptions of their doctors' HIV knowledge and empathy were highly related to their satisfaction with the doctor, and this may improve adherence to treatment. Collaboration between patients and their physicians can result in the selection of regimen that is tailored to meet the lifestyle needs of the patient. Such regimen often have benefits of convenient dosing, low pill burden, and tolerable



side effects that enhance adherence, effectiveness, and the patient's willingness to remain on antiretroviral therapy for long (Chesney, 2003).

Spirituality is a wide concept containing a few key traits, meaning and reason, greatness, connectedness, connections and religiosity (Puchalski, Vitillo, Hull & Reller, 2014). There is a growing evidence of proof recommending that spirituality can assume a key role in promoting good health, well-being and healing (Koenig, King & Carson, 2012) in light of the fact that spirituality presents internal strength, comfort, harmony, health, and completeness (Narayanasamy 2001). An investigation of spirituality and religion in patients with HIV/AIDS found that patients with a profound and strict conviction had more good faith, more confidence, more prominent life fulfillment, and they drank less alcohol (Cotton et al., 2006). They accepted that spirituality is a significant component of wellbeing that lead to an expanded confidence giving a lot of rules that helped them to live a superior or healthier life (Cotton et al., 2006). In grown-ups living with HIV, spirituality helped them to adapt to reactions of ART and expanded adherence (Kremer, Ironson & Porr, 2009).

Other factors include financial problems (Giannetti, 2005), and side effects of medications (Carter, 2004). When HIV patients adhere to HIV medications, it helps them to achieve viral suppression and to prevent the occurrence of opportunistic infections that can lead to morbidity and death.

## **1.2 Problem statement**

Antiretroviral medication adherence continues to be crucial in the effective management of HIV/AIDS. The Ghanaian government in 2003 scaled-up antiretroviral therapy with the major goal of improving the lives of HIV/AIDS patients (Boakye, 2015). This can only be possible

when patients adhere to the medications they are being put on. Numerous studies have examined the prevalence of non-adherence to antiretroviral medication. For instance, Machtiger and Bangsberg (2006) revealed that an estimated 70% of patients on ARVs are non-adherent. The consequential effect is that these patients who are non-adherent are likely to develop resistant viral strain which will not respond to the current spectrum of antiretroviral medication (Ruanjahn, Roberts, & Monterosso, 2010). This will mean that another type of antiretroviral medication will be required with its attendant high financial burden.

Although there is an abundance of literature on factors that improve HIV medication adherence in other nations of the world, not sufficient research has been conducted in Ghana on medication adherence, where HIV prevalence rate stands at 2.4% (HIV Sentinel Survey, 2016). Such research seems warranted in Ghana to inform decision-making and policies in the area of HIV management. The little studies that have been done in Ghana were conducted in hospitals mainly in cosmopolitan cities and regional capitals (see e.g., Annison et al., 2013; Boakye, 2015; Ohene et al., 2013), with little interest in hospitals in rural communities in Ghana, which is the gap this study aims to fill in the literature. The current study assessed how factors such as spirituality, social support, doctor-patient interaction, self-efficacy, patient satisfaction, and HIV related stigma affects patients' adherence to antiretroviral medication in Ghana using a sample of patients living with HIV from a rural hospital in the Ashanti Region, Ghana.

### **1.3 Aim of the study**

The main aim of the study is to examine predictors of medication adherence in the Ashanti Region of Ghana. The specific objectives of this study are to:

1. Examine the impact of spirituality on medication adherence among PLWHIV.

2. Examine gender differences in medication adherence.
3. Assess the impact of doctor's communication skills on medication adherence among PLWHIV.
4. Assess the impact of self-efficacy on medication adherence among PLWHIV.
5. Examine the impact of HIV-related stigma on medication adherence among PLWHIV.
6. Assess the impact of social support on medication adherence among PLWHIV.

### **1.5 Significance of the study**

Findings from the current study would provide context-specific predictors of medication adherence in Ghana to help design effective HIV management programmes. In addition, findings from the current study would provide information to doctors and health workers on how their interactions with patients as well as patient satisfaction affect medication adherence among PLWHIV. Furthermore, the study would contribute to the literature, specifically on medication adherence in HIV clinical care in Ghana.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Theoretical framework**

Various theorists have tried to explain factors associated with adherence. Whiles some have concentrated on the relationship between health workers and patients, others have placed more emphasis on the patients. The social cognitive theory (SCT) and the health belief model (HBM) were used as guiding framework in the current study.

##### **2.1.1 The social cognitive theory (Bandura, 1989)**

One of the major proponents of the Social Cognitive Theory (SCT) is Albert Bandura. The theory postulates that there is a reciprocal association between cognition, behaviour and personal factors, and the environment (Bandura, 1989). These variables according to the theory interact to determine behavioural outcomes (Conde, Alonso, Garau, Roca, & Oliver, 2006). The Social Cognitive Theory (SCT) explains human conduct as a reciprocal, continuous and dynamic interaction between the person and the environment (Bandura, 1989). The common hypothetical basis of cognitive hypothesis is learning; it posits that human behaviour is acquired through learning. Consequently, the SCT posits that behaviour is the aftereffect of the cognitive process that individuals create through the social acquisition of knowledge (Bandura, 1989).

This theory focused around the idea of behaviour capacity, which expresses the notion that before an individual acts in a given situation, the individual has to know what to do and how to do it. Bandura's conceptual model of reciprocal determinism captures the personal determinants of health and wellbeing. He hypothesizes that an individual engages in self-reflective, cognitive, vicarious, and self-regulatory procedures to accomplish a set goal (Bandura, 1989). He states further that individuals bring about change in themselves through their activities

in expectant and proactive ways by exercising control over their conduct through their thought processes, inspirations, and actions.

Bandura posits that individuals remain uninspired and uncertain about their abilities when they have no aspirations. He further said people who take their health seriously have self-belief that helps them to exert control over how they think, feel and behave (Bandura, 1989). Therefore individuals who practice self-management of health behaviours reduce significant health risks and live more productive and healthier lives (Bandura, 1989). According to Bandura, the SCT model holds that individuals' knowledge on health risks and merits of treatment are essential to engaging in health-seeking behaviour. Despite this, self-efficacy also plays an important role in determining health-seeking behaviour. Therefore, the two most important components of SCT when it comes to predicting health-seeking behaviours are "expected outcome" and "self-efficacy".

Social Cognitive Theory is very important in management of HIV and AIDS patients because it assumes that when patients are given important information about their condition, such as the possible complications associated with not taking one's medication, or when they are educated on the best way to take good care of their health, they are likely to adhere to treatment. The SCT can help to explain why some patients on life-long therapies such as antiretroviral therapy become adherent or not. In SCT perspective, medication adherence is not based on one factor but a combination of different factors, which interact to determine whether a person adheres to a treatment plan or not (Bandura, 1989). These factors, according to SCT, could be cognitive and personal factors such as physical functioning, emotional state, depressive symptoms and or environmental factors such as social support, interpersonal relationships among

others, which interact to determine behavioural adherence to antiretroviral therapy (Bandura, 1989).

### **2.1.2 Health belief model (Glanz, Karen, Bishop, & Donald, 2010)**

The health belief model was introduced by Rosenstock, Hockbaum, Leventhal, and Kegels in the 1950s and was modified by Glanz et al. (2010). The model addresses expectancies related to health. It views humans as rational beings to engage themselves in certain behaviours in order to reduce what they perceive to be dangerous or as a threat such as diseases and promote what they conceive as benefits such as adherence to treatment (Glanz et al., 2010). The health belief model is made of many interactive states of belief, which together influence adherence in diseases such as HIV/AIDS. These are perceived seriousness, perceived susceptibility, perceived barriers and perceived benefits (Glanz et al., 2010).

Perceived seriousness implies that individuals are more likely to be proactive in preventing disease they consider more serious than those they believe are not serious or does not carry much threat. When people perceived their HIV infection as serious, they are more likely to follow through a treatment plan and take the necessary precaution to minimize the impact of the disease on them. When they believe that the disease is not serious or does not carry much threat to them. They may not take the medication regularly, or miss doses when they experience side effects. They may even decide not to go for the medication at all.

Perceived susceptibility involves a person's belief that he or she may contract a disease. When he/she believes that it is possible to contract a disease, he/she will be more likely to seek medical advice on how to prevent it. If they do not see themselves as susceptible to a particular disease, they may not put up the necessary behavior to prevent that disease from occurring. In

people with HIV infection, if they believe that not taking their medication will make them more vulnerable to opportunistic infection, they are more likely to adhere to treatment. If not, they may decide not to take their medication believing that nothing can happen to them. Perceived barriers are factors that an individual believes will impede his decision to engage in health-seeking behavior. An individual may feel that treatment will take much of his time, difficult to reach or may not cure him. Therefore, there is no need to spend resources on it.

Lastly, perceived benefits are the advantages an individual believes he or she will get if he or she take treatment seriously. In HIV/AIDS patients, if they believe that following medical advice and taking their drug as recommended will make them strong and healthy and also live long, they are likely to be adherent. If the individual does not anticipate these benefits, he or she may not take the drugs. Modifying variables include personal characteristics, such as demographic, structural and psychosocial variables that can affect perceptions (perceived susceptibility, seriousness, barriers and benefits) of how people seek health.

Self-efficacy was added to the four HBM model constructs (Perceived benefits, susceptibility, seriousness, and barriers) in the year 1988. Self-efficacy refers to how a person perceives his/her capabilities to successfully engage in or perform a behaviour. This was added to HBM to explain the differences in individuals' health-associated behaviour and as a recognition of the fact that individuals' confidence in their ability to effect change in outcome play a key role in health behaviour change. The Health Belief Model is very important in understanding why some people are adherent to medication (HAART) and others are not based on their perception of how serious the HIV disease is, how susceptible to opportunistic infections they are, as well as the benefits of taking ARVs and self-efficacy of the person.

## 2.2 HAART and immune recovery

Antiretroviral treatment (ART) utilizes a mix of HIV/AIDS medications that have explicit inhibitory impacts on HIV replication. These inhibitors have a place with six different classes of medications: the nucleoside and nucleotide reverse transcriptase inhibitors (NRTIs, NtRTIs), the non-nucleoside reverse transcriptase inhibitors (NNRTIs), the protease inhibitors (PIs), the fusion or entry inhibitors (FIs), the CCR5 co-receptor blockers and the integrase inhibitors (INSTIs) (Abrokwah, 2018). Generally, people with HIV have had low CD4 cells before management (Althoff et al., 2010). However, there have been deliberate endeavors to improve testing in people who are at risk and to connect people with HIV to medical care before the HIV infection gets to the advanced stage. Starting ART when CD4 checks decrease puts people with HIV in danger of both AIDS-related and certain genuine non-AIDS conditions. Besides, the extent of CD4 recuperation is directly linked to CD4 count at ART commencement. Thus, many people who begin treatment with CD4 cells 500 cells/mm<sup>3</sup> after as long as 10 years on ART (Moore & Keruly, 2007) have a shorter life expectancy than those starting treatment at higher CD4 count (Samji, Cescon, & Hogg, 2013).

Antiretroviral treatment (ART) is suggested for all people with HIV paying little heed to CD4 T lymphocyte cell check, so as to decrease the disability and death related to HIV disease. ART is additionally prescribed for people with HIV to counteract HIV transmission. The groupings of ART regimens suggested for starting treatment have been changed from recommended, alternative, and other to recommended initial regimens for most people with HIV; and recommended initial regimens in certain clinical situations (Abrokwah, 2018).

To improve and keep up immunologic capacity and keep up viral suppression, ART ought to be taken lifelong. While ART is suggested for all patients, the accompanying conditions



make it more necessary to commence treatment urgently: Lower CD4 cells (e.g., <math><200\text{cells/mm}^3</math>). Although researches have been conflicting in the ideal time to start ART, Samji et al. (2013) demonstrated that ART ought to be started in all patients with HIV, paying little respect to infection stage. The need to start ART urgently is most important in patients with lower CD4 cells, where the outright danger of OIs, non-AIDS disability, and death are elevated. Randomized control trials have long demonstrated that ART improves survival and delays morbidity in patients with higher CD4 cells (Abrokwah, 2018). Various examinations, including biological, natural, and epidemiological investigations and one randomized clinical trial, provide solid proof that treatment of people with HIV can altogether decrease sexual transmission of HIV (Abrokwah, 2018). Lower plasma HIV RNA levels are related to decreasing the amount of infection in sexual fluids (World Health Organisation, 2010).

### **2.3 Global response to HIV**

Around the world, the survival of HIV patients has improved with expanding access to antiretroviral treatment (ART). By 2014, 40% of qualified HIV-infected people had started ART worldwide (UNAIDS, 2016). Around the same time, the Joint United Nations Programme on HIV/AIDS (UNAIDS) provided the 90-90-90 targets, which set for 90% patients living with HIV to know their HIV status, 90% diagnosed with HIV disease to get continuous ART services and 90% of HIV infected individuals receiving ART to have HIV viral suppression (UNAIDS, 2016). As evident in the expanding CD4 count in patients at ART commencement across the world, a pattern towards early ART initiation is gaining popularity in many nations (Avila et al., 2015). With the scale-up of ART, the decrease in early mortality found in first-world nations more than 20 years ago has turned out to be apparent in sub-Saharan Africa (Abrokwah, 2018).

For instance, it was observed in a study in Botswana, that mortality in the year after ART commencement diminished from 7% to 2% from 2002 to 2012 (Farahani et al., 2016).

## **2.4 National response to HIV/AIDS**

The Ghana AIDS Commission is the planning body for all HIV/AIDS-related exercises in the nation; it directs an extended response to the pandemic and is in charge of completing the National Strategic Framework on HIV/AIDS for the 2001–2005 period. The Ghana AIDS Commission surveyed the National Strategic Framework II, covering 2006–2010, with partners, and two-sided and multilateral partners. The systems focus on diminishing new HIV infection, address administration conveyance issues and individual and societal vulnerability, and advance the foundation of a multisectoral, multidisciplinary way to deal with HIV/AIDS programs (Ghana Aids Commission, 2010)

Ghana's primary objective is to eradicate new HIV diseases just as to alleviate the financial and mental impacts of HIV/AIDS on people, networks, and the country. The principal national key arrangement concentrated on five subjects: the anticipation of a new infection; care and support for individuals living with HIV/AIDS; production of an empowering domain for a national reaction; decentralization of usage of HIV/AIDS exercises through institutional plans; research; and observation and assessment of projects. The second national key arrangement, at present, centers around: approach, backing, and empowering condition; coordination and the executives of the decentralized reaction; relieving the financial, sociocultural, and lawful effects; counteractive action and behavior change communication; treatment, care, and backing; research and observation; and checking and evaluation (Ghana Aids Commission, 2010).

The non-governmental organizations, civil society associations and multilateral partnership, effectively took interest in the national response, with an excess of 2,500 network-based associations and NGOs apparently implementing HIV/AIDS exercises in Ghana. Generous financing for HIV/AIDS exercises is received from the Ghana AIDS Commission. Exercises incorporate the five-nation, World-Bank-drove HIV/AIDS Abidjan-Lagos Transport Corridor venture; the World Bank-financed treatment acceleration program for private association in HIV/AIDS management; WHO 3 by 5 activity; the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Ghana Aids Commission, 2010)

Following the Declaration of Commitment of the United Nations General Assembly Special Session on HIV/AIDS in 2001, the Government of Ghana reserved 15% of its budget on health for HIV/AIDS exercises, and all Ministries were made to put money aside for HIV/AIDS-related activities. Accessible financial support to help Ghana's response to the HIV/AIDS disease incorporates about \$6.7 million from donors; about \$12 million from multilateral organisations, including the World Bank; and about \$8 million from the global fund. In view of the degree of financing officially dedicated by the national government and its contributors, WHO gauges a \$5 to \$12.8 million financial assistance gap for HIV/AIDS exercises in Ghana for the period 2004–2005 (Ghana Aids Commission, 2010).

## **2.5 Antiretroviral therapy adherence**

The emergence of combined antiretroviral treatment (ART) has drastically decreased disability, death, and transmissibility of HIV (UNAIDS, 2016). Out of the 17 million individuals estimated to be on ART across the world, an average of 12 million lived in sub-Saharan Africa and 2 million in Asia, the two places most affected by the HIV disease (UNAIDS, 2016).

Continuously high levels of adherence to ART is vital to achieving viral suppression and delayed

progression of the disease (Gardner, Burman, Steiner, Anderson, & Bangsberg, 2009). The Joint United Nations Program on HIV/AIDS (UNAIDS) 90–90–90 worldwide treatment target stress continued viral suppression and the need for sustained adherence (UNAIDS, 2014). Describing and understanding the determinants of adherence in settings with the most astounding disease burden will be basic to achieving this target (O'Connor et al., 2013). Regardless of the good short-term data on adherence in low-income nations, concerns remain that long-term adherence might be imperfect as a result of different hindrances including the absence of fundamental health education and enrolment in massive ART programs with constrained capacity with regards to patient monitoring and support (Safren et al., 2014).

## **2.6 Review of related works**

The subject of adherence among PLWHIV has been of interest to many researchers over the years. Some researchers have linked the level of medication adherence among HIV/AIDS patients with a different clinical and immunological outcome such as an increase in CD4 cells and decrease in opportunistic infections and viral load (Ankrah et al., 2015; Boakye, 2015). Others have also looked at how certain clinical factors such as drug side effects, adverse reactions, dosing frequency, and pill burden, dietary restriction affect the level of adherence (Aurugai, Kwasa & Oyabba, 2006; Carter 2004; Murphy, Marelich, & Hoffman, 2004). Other factors that have been investigated include; forgetfulness (Wang & Wu, 2007), language barrier (Ashton et al., 2003), cost of transportation (Hardon, Akurut & Comoro, 2007), medication out of stock (Erah & Arute, 2008).

### **2.6.1 Spirituality and adherence to ART**

The African continent is widely known for its belief in spirituality. Mbiti (1975) asserted many years ago that belief in spirits forms part of the religious ancestry of Africans. Spirituality,

broadly conceptualized as that which gives purpose and meaning to existence, is an individual's belief in a superior being apart from his/her own life. Spirituality comprises many important attributes, purpose and meaning, connectedness, transcendence, religiosity and relationships (Puchalski, Vitillo, Hull, & Reller, 2014). There is a belief that there are two forms of spirits: Benevolent spirits and malevolent spirits (Igbende, Aumber, Ogwuche, Anhange, & Atsehe, 2016). Benevolent spirits are believed to assist men while malevolent spirits are responsible for human predicaments such as disasters, accidents, and sickness such as HIV/AIDS. For instance, a study by Puchalski et al. (2014) showed that spirituality plays a role in every aspect of many people's lives.

There is evidence pointing to the fact that spirituality is important in healing, nurturing wellbeing, and good health. (Koenig, King, & Carson, 2012) in the sense that spirituality gives inner strength, peace wholeness, comfort and wellness (Balthip, Mcsherry, & Nilmanat, 2017). Cotton et al. (2006) found that patients who were highly spiritual or religious were also more optimistic, had high self-esteem, had greater life satisfaction and took less alcohol. Other studies have found high spirituality to be associated with improved medication adherence in PLHIV (Parson, Cruise, Davenport, & Jones, 2006) and HIV preventive behaviours (Galvan, Collins, Kanouse, Pantoja, & Golinelli, 2007). However, Kremer, Ironson and Porr, (2019) found that spirituality could be a hindrance to medication adherence. In addition, Finocchario-Kessler et al. (2011) and Igbende et al. (2016) found a negative relationship between spirituality and HIV medication adherence.

A study by Kretchy, Owusu-Daaku, and Danquah, (2013) to find out whether spirituality and religiosity matter in medication adherence in hypertensive patients in Ghana using 400 hypertensive patients above 18 years of age observed that, close to 95% of the participants were

nonadherent to their antihypertensive medication. In addition to this finding, spirituality and religious beliefs formed an important aspect of their lives. They found that spirituality was directly related to non-adherence but not religiosity. Patients who were highly spiritual were 2.68 times more likely not to take their medication than those who were less spiritual. They concluded that spirituality of patients increased their trust in expectation of divine healing rather than adhering to antihypertensive drugs. Igbende et al. (2016) examined belief about spiritual healing and medication adherence using 143 patients attending Sankara General Hospital in Nigeria and reported that patients who believed that their current health predicament can be cured by their supreme being were less likely to take HIV medications.

Several other studies have demonstrated that spirituality is important to HIV patients because it affects their health-seeking behaviour as well as their quality of life (Tumwine, Neema, & Wagner, 2012; Vyas, Limneous, Qin, & Mathews, 2014). Research shows that individuals take into consideration their spirituality after being diagnosed of HIV by involving their belief in God and past religious and spiritual knowledge as part of their coping with the condition (Utley & Wachholtz, 2011). Despite numerous studies on spirituality and medication adherence in patients with chronic conditions including HIV elsewhere, there is little literature on the same in Ghana. The relationship between spirituality and medication adherence, therefore, requires further study, especially in Ghana.

### **2.6.2 Social support and adherence to ART**

Melrose, Brown and Wood (2015) defines social support as the extent to which an individual's fundamental social needs are met through interaction with others, and the feeling that a person's needs are recognized and acknowledged, and that people value his or her needs and care about him/her when he or she needs help and feels alone. Several authors have posited

that social support plays a key role when it comes to medication adherence. For instance, Rabinovitch, Bechard-Evans, Schmitz, Joober, and Malla (2009) observed that poor social support from family contributed to poor adherence among psychiatric patients. Other researchers such as Bolkan and Bonner (2013) as well as Razali and Yusoff (2014) have also found a significant positive relationship existing between social support and medication non-adherence among patients. According to these authors, several reasons accounted for this relationship, prominent among these is the fact that family plays a basic role in reinforcing medication adherence especially in psychiatric patients.

A study by Luszczyńska et al. (2007) to investigate the relationship between social support, and adherence to ART among 104 PLWHIV reported that adherence was correlated to having social support, finding more benefits and high self-efficacy. They did path analysis to reveal that social support was correlated to both improved physical functioning and finding more benefits in PLWHIV. These findings show that patients who have more social support are more likely to be adherent and have improved physical functioning (Luszczyńska et al., 2007). Krishna et al. (2015) also did a study to investigate the association between perceived family support and adherence to HIV drugs among HIV-positive patients in Nepal. They used 233 HIV-positive patients, and reported that high levels of emotional support from family were related to diminished risk of antiretroviral non-adherence, compared to low perceived emotional support. Higher levels of emotional distance were correlated to increased risk of non-adherence. The authors recommended that health workers need to know of the important role of family support in predicting antiretroviral adherence to help them encourage it among their patients.

Family social support has a crucial role to play in ART medication adherence among HIV+ clients. Research has reported a positive link between family support measures and ART

medication adherence (Dong, Thabethe, & Hurtado, 2007; Rotheram-Borus, Stein, & Jiraphongsa, 2010; Sellier, Clevenbergh, & Ljubicic, 2006). These results demonstrated that familial ties play a key role in health-seeking behaviours, illness adaptation, medical health care use and coping. This notwithstanding, other studies have also reported negative or non-significant association between family interaction and ART medication adherence among HIV patients, especially when there is fear of stigma and discrimination (Obirikorang et al., 2013; Rao, Kekwaletswe, & Hosek, 2007; Woodward & Pantalone, 2012; Wrubel, Stumbo, & Johnson, 2008).

### **2.6.3 Self-efficacy and adherence to ART**

Self-efficacy has been generally defined as one's belief in his or her own ability to successfully complete a certain task (Bandura, 1997). The relationship between self-efficacy and ART adherence is a subject under continual investigations by various researchers. Some studies have already found a link between self-efficacy and medication adherence (Colbert, Sereika, & Erlen 2013; Kerr, et al., 2004; Johnson et al., 2006). This supports the position that engaging in health-promoting behaviours such as adhering to ART regimen is influenced by an individual's belief that he or she can exert control over his or her own thought processes motivation, patterns of behaviour and emotional states. When people lack self-esteem, they are not able to adequately deal with obstacles and they easily go through psychological distress (Bandura, 1997).

Adefolalu, Nkosi, Olorunju, and Masemola (2014) did a study on medication beliefs and self-efficacy on adherence to antiretroviral therapy using participants from Pretoria in South Africa. They recruited 232 participants with a mean age of 40 years, 30% of the participants were males and 70% of them were females, about 80% of these patients had been taking HIV medication for more than two years. The study found a strong positive relationship between HIV



medication adherence and adherence self-efficacy. The authors concluded that interventions aimed at improving medication adherence should factor adherence self-efficacy as a key predictor of adherence.

Again, a study by Aragonés, Sánchez, Campos, and Pérez (2011), in Cuba using 847 patients with retroviral infection reported that 70% of the respondents had high levels of adherence. It was also found that self-efficacy was a significant predictor of medication adherence among participants used in the study. They did not find any significant difference between demographic factors such as age, residential location, time of diagnosis when it comes to adherence. They also observed that doctor-patient communication was a significant predictor of medication adherence among the population. The authors concluded that self-efficacy and doctor-communication should be promoted to improve adherence.

Another research by Proeschold-Bell et al. (2013) revealed that there are three self-efficacy factors that improve adherence. They reported that they found getting support, provider communication and management of mood as three types of self-efficacy factors that improve adherence. They, therefore, suggested that to improve adherence among patients on life-long treatment, these factors should be improved upon to ensure adherence among patients.

Again, a study by Cobblah (2016) on factors affecting adherence to antiretroviral therapy in Greater Accra region revealed that factors that contribute to medication adherence include treatment and self-efficacy factors, personal factors as well as environmental factors. She, therefore, recommended that there is a need to educate HIV patients continuously on the benefits of adherence to HAART.

In addition, a study by Oshotse et al. (2018), on how self-efficacy influences adherence among patients with Rheumatoid Arthritis revealed that changes in a patient's self-efficacy with

time were as a result of their earlier acceptance or otherwise of the diagnosis. They also identified that medication adherence is a spectrum that ranges from non-adherent to adherent, and where a patient falls in this spectrum is largely influenced by their self-efficacy.

Moreover, research by Werren-Findlow et al. (2011) identified that, in managing any chronic disease like hypertension, an individual needs to take good care of himself, they identified that self-efficacy is particularly important in hypertensive self-care. Fernandez et al. (2008) also agreed to this recommendation by Warren-Findlow and colleagues.

Furthermore, Dworkin et al. (2018) investigated how patients' ability to read and self-efficacy affected their adherence to antiretroviral medication using 123 respondents from four hospitals in Chicago. They reported that self-efficacy and ability to read consistently significantly predicted medication adherence irrespective of duration on treatment. They concluded that self-efficacy and ability to read are important factors to consider in antiretroviral medication adherence.

Reif et al. (2013) also conducted a study in the southern part of the United States, where they investigated how three types of self-efficacy influence medication adherence among HIV patients who use substances. They recruited 154 HIV positive patients who were also diagnosed with substance use disorder. The three types of self-efficacy that the researchers used were one's confidence that one can communicate effectively with healthcare providers, manage mood and get support. They also wanted to know how symptoms of depression moderate the relationship between the two. The result of the study showed that these three types of self-efficacy individually predicted medication adherence significantly among patients with possible depression and anxiety symptoms. They concluded that one of the benefits of enhancing self-efficacy in these patients is improved medication adherence.

Aregbesola and Adeoye (2018) conducted a study in South-West Nigeria among HIV positive pregnant women to assess how self-efficacy influenced antiretroviral medication adherence. They recruited 126 women for the study. They reported that low levels of self-efficacy were associated with medication non-adherence among pregnant women. They also found that protecting unborn babies from getting HIV infection and looking healthier were also factors that motivated the pregnant women to adhere to antiretroviral therapy. They concluded that intervention that aimed at increasing HIV medication adherence in pregnant women should focus on HIV-treatment adherence self-efficacy.

#### **2.6.4 Doctor-patient communication and adherence to ART**

The doctor-patient interaction is a reciprocal, socially constructed, and dynamic process (Parker, Davison, Tishelman, Brundage, & Team, 2005; Street, 2003). Doctor-patient communication is a crucial part of a healing relationship. It is the means by which patients and doctors interact; it provides the basis for the establishment of trust and for exploring patient's values. Patient-centered care involves a complex interaction between patients and a doctor in which there is a shared vision, goals, and cooperation to optimize health (Jackson, 2005). The doctor-patient relationship allows the clinicians to assess, inform, and support the patient which leads to positive patient outcomes such as emotional and physical wellbeing, ability to control pain, adherence to a treatment plan, information recall, patient satisfaction, and psychological adjustment (De Vries et al., 2014). Excellent clinician-patient relationships are associated with improved adherence in patients with chronic illness and better clinical outcomes (Stewart, 1995). Martini et al. (2002) found that patients who were satisfied with the clinician-patient relationship were adherent to HIV medication in an Italian multicenter study. Bakken et al. (2000) in a correlational study of 707 outpatients found that patients who were more engaged with their

healthcare provider better adhered to medications and appointments and had better immune health than their less-engaged peers. These results point to the fact that patient-clinician relationships may be useful for medication adherence and clinical outcome in HIV management.

Amin, Kabir, Karami, and Nahar (2018) conducted a study to determine how physician communication with patient plays a role in medication adherence among 253 hypertensive patients receiving care at a military hospital in Dhaka. They observed among other things that, the duration that a doctor spends with a patient had a significant effect on medication adherence. They also observed a highly significant relationship between doctor-patient communication and medication adherence. Their Binary logistic regression showed that participants were 3.23 times more adherent when it comes to taking their HIV medication when they respond positively to the item 'The doctor gave me much information as I needed'. They concluded that it is important to formulate measures to help doctors improve their communications skills. This study brought to light how important communication skills of physicians are to medication adherence.

Zolnierek and DiMatteo (2009) conducted a meta-analysis to find how physician communication impact on medication adherence. They used published literature between 1949 and 2008 which included 106 correlational studies and 21 experimental interventions. They found that physicians' communication is a significant positive predictor of medication adherence. They reported that patients whose physicians did not communicate well to were 19% more likely to be non-adherent than those whose physicians communicated well with them. They recommended that training physician to communicate well with the patient will help improve medication adherence significantly in patients on life-long treatments.

A study by Friedman et al. (2008) to investigate factors that contribute to adherence among tropical ocular hypotensive therapy patients using 300 patients with glaucoma and 103

physicians. Findings from the study revealed that doctor-patient communication as well as health-related beliefs the respondents (patients) contributed significantly to medication adherence.

Dapaah, (2016) researched the attitude and behaviours of health service providers and how that affected the use of HIV/AIDS facilities by patients in Ghana. He specifically looked at health workers involved in HIV management communication and behaviour towards HIV patients. He used in-depth interviews with patients, informal interactions, and observatory methods to gather data from health service providers in HIV management and patients for the study. He found that most of the health care providers showed a positive attitude towards the patients with the exception of a few who were rude. Some health workers even supported the patients financially and provided important advice to them. Patients were satisfied with the behaviour of the health workers and reported high compliance with what they have been told to do.

### **2.6.5 HIV-related stigma and adherence to ART**

HIV-related stigma constitutes a significant barrier that negatively affects HIV medication and treatment adherence and thereby increasing rates of transmission of the disease (Katz et al.,2013). HIV-related stigma is known to be a social and structural phenomenon that includes stereotyping, status loss, and discrimination existing in societies (Mahajan et al., 2008). In 2001, the Declaration of Commitment on HIV/AIDS was made and governments across the globe agreed to a commitment to reduce stigma and discrimination (MacQuarrie, Eckhaus, & Nyblade, 2009). In 2005-2006, regional and continental consultations on worldwide access to HIV treatment, support, and care as well as prevention revealed that HIV-related stigma was a major barrier to universal access to care and undermined the effectiveness of the global response

to the HIV epidemic (MacQuarie et al., 2009). HIV-related stigma is still held to be the number one reason why many individuals fail to see a doctor to know their HIV status and to seek treatment if infected (Marta, 2008). Stigma plays a key role in making HIV/AIDS a ‘silent killer’ and it is one of the reasons why HIV/AIDS continues to devastate many countries and nations across the world (Marta, 2008).

A number of studies have focused particularly on the relationship between adherence to ART and HIV-related stigma (Li et al., 2011; Okoror, Falede, Olorunlana, Walker & Okareh, 2013; Steteerheim et al., 2009; Taylor et al., 2014). The findings from these studies almost consistently found a negative relationship between high levels of HIV-related stigma and low levels of adherence to ART medications. Some researchers have tried to investigate the link between adherence and different forms of stigma such as enacted, internalized, and perceived stigma (Downshen, Binns, & Garofalo, 2009; Logie & Gadalla 2009; Mahajan et al., 2008). For example, Lyimo et al. (2014) found that perceived stigma compared to enacted and internalized stigma, could have a greater impact on disclosure of HIV status, which in turn affects adherence. Olusegun et al. (2014) in their work on how stigmatization affects adherence to antiretroviral medication among patients receiving care at rural Nigeria, reported that patients who had low levels of stigma and discrimination had good medication adherence levels.

Mao, Li, Qjao, Zhou, and Zhao (2017) also conducted a study to assess how stigma and ethnicity impact on medication adherence. They used 2,146 patients who have been diagnosed with HIV infection in Guangxi, a province in China. The result from their multiple binary regression indicated that patients who experienced enacted stigma were less adherent to antiretroviral therapy, patients with low internalized stigma were more adherent than those who reported high levels of internalized stigma.

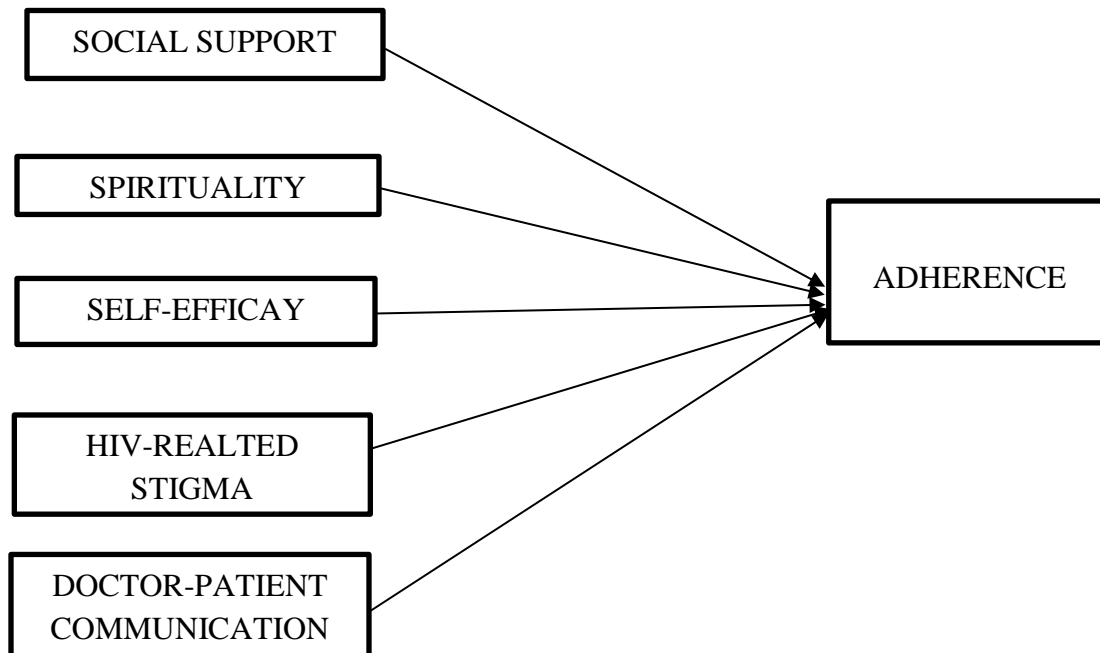
## **2.7 Rationale of the study**

Researchers, especially those in the medical sciences have concentrated on the effect of non-adherence on clinical outcomes (Anude et al., 2013; Boakye, 2015; Fairall et al., 2008; Wang et al., 2008). In Ghana the few studies that have concentrated on factors that affect adherence were done in the teachings hospitals, regional hospitals and other hospitals in the cosmopolitan cities such as Accra and Kumasi (see for e.g Mensah et al., 2014; Obirikorang, 2013; Ohene & Forson 2009) with little from the rural areas. Moreover, these research works used mostly qualitative approaches and thus could not use large sample sizes. Therefore, it was deemed necessary to conduct a study, which is quantitative in nature and which focuses on a rural hospital that has most of its patients coming from rural communities. A quantitative study requires a large sample size and has the potential of providing important information on factors associated with medication adherence in rural population. Therefore, the aim of this study was to examine predictors of medication adherence among PLWHIV/AIDS in the Ashanti Region using participants from Agogo Presbyterian Hospital in the Asante Akim North district.

## **2.8 Research hypotheses**

1. Patient spirituality will be a significant negative predictor of HIV medication adherence (see Figure 1).
2. Women will score significantly higher on medication adherence than men.
3. Doctor-patient communication will significantly positively predict medication adherence.
4. Patient self-efficacy will significantly positively predict medication adherence.
5. HIV related stigma will be a significant negative predictor of HIV medication adherence.
6. Patients' with strong perceived social support will have significantly higher medication adherence than those without perceived social support.

## 2.9 Conceptual framework



**Figure 1: Hypothesised conceptual model**

## 2.10 Operational definition

*Medication Adherence* – this refers to how patients (HIV patients) take their medications as prescribed.

*Spirituality* – Spirituality means that which gives meaning and purpose to existence, is an individual's belief in a superior power apart from his/her own existence

*Doctor-Patient Communication* – This refers to how a physician providing HIV care communicates with and to the patient.



*Social Support* – It is the extent to which an individual's fundamental social needs are met through interaction with others and feeling of connection that a person's needs are recognized and acknowledged that people value his needs and care about him/her when he needs help and feels alone.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.0 Introduction**

This chapter presents a methodology for the study. Under this section, the target population would be described, sample size, sampling technique, and research design used in the study would be discussed. This chapter would also describe the various instruments used for data collection, how the instruments were piloted and their psychometric properties. Also, the data collection procedures would be discussed.

#### **3.1 Research Design**

A quantitative cross-sectional research approach was employed for this study. A cross-sectional survey design was used since the researcher wanted to collect data from the HIV clinic at one point in time in order to make inferences about the patients (Creswell, 2008). The researcher was interested in understanding the relationship between the predictors of medication adherence to HIV during the research period to inform decision making.

#### **3.2 Study Area**

The study was conducted at Agogo (see Figure 2) in the Asante Akim North district in the Ashanti Region. This place was chosen because it is the second largest hospital in the Ashanti Region (Agogo Presby Hospital) and has one of the most vibrant HIV clinics in the region, most of the patients in the hospital come from rural communities. It offers outpatients services for adult patients and it operates under the internal medicine department



Source: (Google Map, June 2019)

**Figure 2: Map of the study setting**

### **3.3 Study Population**

The population for this study was Persons Living with HIV (PLWHIV) receiving clinical care at Agogo Presbyterian Hospital in Agogo, Asante Akim. Only patients who have been diagnosed with HIV type 1, type 2 or type 1 and type 2 co-infection and have been put on medication (HAART) were included in the study. Patients who declined to sign the informed consent and those who were too ill to answer the questionnaire were excluded.

### **3.4 Procedure**

The first step was to seek a formal request from the Department of Psychology for a letter of approval in conducting the study. This letter, together with a research proposal and other relevant documents were taken to the University of Ghana Ethics Committee for approval before data collection. After an approval was given by Ethics Committee for the Humanities, University of Ghana. Permission was sought from the Internal Management Committee (IMC) of Agogo Presbyterian Hospital.

In an attempt to protect the rights of patients, informed consent was sought by allowing participants to append their signature before filling the questionnaire. The aim of this study was explained to the patients both verbally and in writing. Consent was sought before administering questionnaires. Perceived coercion to some extent might influence the results of the study and hence, participants were informed that they are not obliged by the hospital to partake in the study. As a result, there would be no retribution in situations whereby they choose not to take partake or pull out from the study. In order to ensure anonymity and confidentiality, participants were advised not to write their names or mark the questionnaires which might reveal their identity. Information shared by the participants in the study was termed as confidential and thus, participants were guaranteed that the data would not be released to any third party without an authorization from them.

An assurance was given to the participants that the ultimate purpose of this study is for academic purpose. Participants were given the awareness that the only demographic to be used for this study would be that of age, religion, region, educational background. Hence, other personal information released by the participants was not part of the analysis and interpretation of results. Participants were also guaranteed that any information released would be kept in a secured lockbox for which the researcher would be liable for any leakages of information to any third party without participants' approval

Measuring instruments were piloted using 30 patients from a similar antiretroviral clinic in the Ashanti Region to establish the reliability and validity of the measures before the actual study commenced. The questionnaire administration took about 15 minutes. Participants who were not literate in the English language were assisted to complete the questionnaires. Data collection spanned the beginning of March 2019 until the first week of May 2019.

### **3.5 Sampling technique and sample size**

The sampling technique was purposive and convenience sampling. The hospital used for the study has 1400 registered HIV patients. However, there were about 800 active patients who come regularly for their medication. The clinic operates twice a week with an average turnout of 50 patients per clinic day. A sample size of 349 participants were recruited and used in this study.

### **3.6 Inclusion Criteria**

The inclusion criteria were patients who have been diagnosed with the HIV virus and are on Highly Active Antiretroviral Therapy (HAART), and who are at least 18 years of age or older.

### **3.7 Exclusion Criteria**

Newly diagnosed patients who are not yet on medication and patients who were too ill to respond to the questionnaire were excluded. Those below the age of 18 were also excluded.

### **3.8 Research Measures**

All constructs in the study were measured using structured questionnaires. The questionnaire was divided into two main sections. Section 1(A) which measured the participant's demographic information. Section 2 (B) measured the study variables which include; Medication adherence, General self-efficacy, Spirituality, Doctor-patient communication, Perceived social support and HIV-related stigma.

### **3.8.1 Section A: Demographic questionnaire**

The questionnaire gathered information on participants' sex, age, occupation, comorbid conditions, religion, and educational level.

### **3.8.2 Section B:**

#### **12-Item HIV Stigma Scale (Reinius et al. 2017)**

This was used to measure enacted, anticipated and internalized stigma in PLWHIV. The scale has four main subscales with three items assessing each subscale, namely; Personalised stigma, Disclosure concerns, Concerns about public attitude, and Negative self-image. The items on the scale are on a 4-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). The Cronbach Alpha for the three sub-scales range from .80 to .88 and that of the overall scale ranged from .70 to .75 (Reinius et., 2017).

#### **General Self-Efficacy Scale (Schwarzer & Jerusalem 1995)**

The scale is a self-report measure of self-efficacy. It has 10 items on a 4-point Likert scale ranging from 1 (*not at all true*) to 4 (*exactly true*). The Cronbach alpha ranged from .76 and .9 (Schwarzer & Jerusalem, 1995).

#### **The Multidimensional Scale of Perceived Social Support (Zimet et al., 1988)**

This scale measures perceived social support from family, friends and significant others. It is a 12-item scale on a 7-point Likert scale ranging from 1 (*very strongly disagree*) to 7 (*very strongly agree*). The Cronbach alpha for the sub-scales ranges from .81 to .98 and .84 to .92 for the whole scale (Zimet, Powell, Farley, Werkman, & Berkoff, 1990).

#### **Spirituality Scale (Delaney, 2003)**

The Spirituality Scale (SS) is a researcher-developed instrument that attempts to assess the human spiritual dimension as it is manifested in adult populations. The scale is a 23-item scale and on 6-point Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Delaney (2003) reported a Cronbach alpha ranging from .81 to .94 for this scale.

#### **Communication Assessment Tool (CAT; Makoul et al., 2015)**

The CAT assesses patient perception of physicians' interpersonal and communication skills. It has a 5-point Likert scale response from 1 (Poor) to 5 (Excellent). Makoul et al. (2015) reported a Cronbach alpha of .96 for this scale.

#### **Medication Adherence Rating Scale (MARS; Thompson, Kulkarni, & Sergejew, 2000)**

Antiretroviral adherence was assessed by 4 items selected from previous research (Medication Adherence Rating Scale [MARS]; Thompson, Kulkarni, & Sergejew, 2000). The items were slightly modified for this study. The items were originally scored 0 (*yes*) or 1 (*no*). In the current research, because we adapted the items, we also slightly modified the response scale using a five-point Likert scale ranging from 1 (*very untrue of me*) to 5 (*very true of me*). A Cronbach alpha of .81 was reported for this scale in this study.

### **3.9 Data Analysis**

The Statistical Package for Social Sciences (SPSS) version 16 was used in analyzing the data. Standard multiple regression was used to test the proposed hypotheses (i.e. hypotheses 1,3,4, 5 and 6). Hypothesis 2 was tested using Independent Samples t-test.

### **3.10 Ethical considerations**

The researcher sought ethical clearance from the Ethics Committee for the Humanities, University of Ghana. According to Creswell (2007), research participants have a right to; voluntary participation, informed consent, protection from harm, anonymity, confidentiality, dignity, and self-respect. Each participant was well informed about the aim and objectives of the study and what he or she was required to do, before signing the consent form. Participants were assured of confidentiality and that their participation in the study was strictly voluntary. They were informed that if they refused to take part in the study, it would not affect their treatment in any way.

## **CHAPTER FOUR**

### **RESULTS**

#### **4.1 Demographic characteristics**

Table 1 presents the demographic variables examined in the study. It can be observed from Table 1 that, out of the 349 participants recruited, 22 (6.3 %) were between the ages of 18



and 25, while 159 (45.6%) were between the ages of 26 and 35. In terms of gender, 173 (49.6%) were male whereas 176 (50.4%) were female (see Table 1). Other relevant demographic information can be found in Table 1 below.

Table 1

*Summary of demographic characteristics of PLWHIV patients.*

<b>Demographic Variable</b>	<b>Categories</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Age</b>	18-25yrs	22	6.3
	26-35yrs	159	45.6
	36-45yrs	109	31.2
	45yrs and above	59	16.9
	<b>Total</b>	<b>349</b>	<b>100</b>
<b>Sex</b>	Male	173	49.6
	Female	176	50.4
	<b>Total</b>	<b>349</b>	<b>100</b>
<b>Marital status</b>	Married	45	12.9
	Single	116	33.2
	Cohabiting	114	32.7
	Divorce	37	10.6
	Widowed	37	10.6
	<b>Total</b>	<b>349</b>	<b>100</b>
<b>Religion</b>	Christian	268	78.8
	Muslim	67	19.2
	Traditionalist	12	3.4
	Other	2	.6
	<b>Total</b>	<b>349</b>	<b>100</b>
<b>Employment status</b>	Employed	160	45.8
	Unemployed	180	51.6
	Other	9	2.6
	<b>Total</b>	<b>349</b>	<b>100</b>
<b>Level of Education</b>	Tertiary	43	12.3
	SHS	51	14.6
	JHS	137	39.3

Primary	78	22.3
None	40	11.5
<b>Total</b>	<b>349</b>	<b>100</b>

## 4.2 Preliminary analysis

The preliminary analysis of data included exploratory factor analysis, analysis of normal distribution, descriptive analysis, reliability analysis, and correlation matrix using Pearson Product's Moment correlation coefficient.

### 4.2.1 Exploratory factor analysis

Construct dimensionality was verified with exploratory factor analyses using the factor loading criterion of .40 and above (Field, 2009). None of the items on the scales was deleted. All the items in the various measures were unidimensional. The KMO for all the measures were above .60 and Bartlett's test of sphericity were all significant at the .05 decision rule HIV-related stigma scale had the following indices (KMO = .95, Bartlett's test of sphericity = .00), Spirituality scale (KMO = .98, Bartlett's test of sphericity = .00), Doctors-patient communication scale (KMO = .96, Bartlett's test of sphericity = .00), General self-efficacy scale (KMO = .94, Bartlett's test of sphericity = .00), and Perceived social support scale had the following indices (KMO = .96, Bartlett's test of sphericity = .00). The measurement indices showed the scale was suitable for factor analysis.

### 4.2.2 Analysis of normal distribution of variables

Normal distribution test was done by focusing on the skewness and kurtosis scores for the main variables in the study. From Table 2, the skewness and kurtosis fall within -1.60 to +.57. Tabachnick and Fidell (2007) indicate that data are normally distributed when both the skewness

and kurtosis are within the criteria of -2 to +2. Hence, the range obtained from this study explains that the data is said to be normally distributed.

#### **4.2.3 Reliability analysis of the scale**

In order to find out the reliability of the scales used in the study, the coefficient of the internal consistency, also known as Cronbach alpha, was computed. The coefficient of the internal consistency of the various measures used in this study are as follows: Medication adherence (number of items = 4,  $\alpha = .97$ ); HIV-related stigma (number of items = 12,  $\alpha = .94$ ); General self-efficacy (number of items = 10,  $\alpha = .94$ ); Spirituality (number of items = 18,  $\alpha = .98$ ); Communication assessment of physicians (number of items = 15,  $\alpha = .97$ ); Perceived social support (number of items = 12,  $\alpha = .98$ ); reliability of subscales of perceived social support: Support from significant others (number of items = 4,  $\alpha = .93$ ); support from family (number of items = 4,  $\alpha = .93$ ); support from friends (number of items = 4,  $\alpha = .92$ ). See Table 2 for all the psychometric properties of the scales used in this study. Field (2009) states that alpha coefficient values above 0.80 indicate that the scale is reliable. Thus, the values obtained from the measures in this study indicate good reliability coefficients

#### **4.2.4 Descriptive analysis**

Descriptive statistics of the measures was done by summarizing the raw data obtained to find the mean and standard deviation. The results of the analysis are presented in Table 2 below.

Table 2

*Summary of Descriptive Statistics of variables in the Study*

Variable	Mean	SD	Min.	Max.	Skewness	Kurtosis	Alpha
Medication adherence	11.42	5.16	4.00	20.00	.31	-1.39	.97
HIV-related stigma	31.33	9.22	15.00	48.00	.20	-1.60	.94
General self-efficacy	25.06	7.46	13.00	39.00	.07	-1.56	.94
Spirituality	75.47	22.22	19.00	108.00	-.87	-.74	.98
Communication tool	44.66	14.15	15.00	74.00	.13	-1.36	.97
Support from sig. others	15.11	5.54	5.00	27.00	.56	-.82	.93
Support from family	15.05	5.31	5.00	27.00	.57	-.73	.93
Support from friends	15.16	5.28	6.00	28.00	.54	-.77	.92

*N* = 349

#### 4.2.5 Intercorrelation Matrix for the Study Variables

The Inter-correlation matrix was analyzed using the Pearson Product Moment Correlation and the results are presented in Table 3.

Table 3

*Inter-correlation matrix for the main study variables*

Variables	1	2	3	4	5	6	7	8
Medication Adherence	-							
HIV Related Stigma	-.67***	-						
General Self-Efficacy	.58***	-.70***	-					
Significant Others Support	.64***	-.54***	.67***	-				
Family Support	.61***	-.54***	.65***	.79***	-			
Friends Support	.56***	-.45***	.60***	.78***	.75***	-		
Spirituality	-.64***	.50***	-.58***	-.77**	-.76***	-.75***	-	
Interpersonal Communication	.72***	.76***	.76***	.71***	.70***	.66***	-.64***	-

*Note: \*\*\* Correlation significant at the 0.001 level, N = 349*

### 4.3 Hypothesis Testing

The various hypotheses were analyzed using Standard Multiple Regression.

Table 4

*Summary of Multiple Regression for Predictors of HIV Medication adherence*

Model	B	SE B	$\beta$	F	P
Constant	17.45	2.22		85.04	.001
HIV-related stigma	-.19	.03	-.33		.001
General self-efficacy	-.12	.04	-.17		.001
Spirituality	-.06	.01	-.26		.001
Doctors communication skills	.14	.02	.39		.001
Support from Significant others	.39	.13	.42		.001
Support from family	-.20	.12	.42		.09
Support from friends	-.14	.10	-.14		.16

$R^2 = .638$ , \*\*  $p < .00$

A multiple regression analysis of the relationship between HIV-related stigma, General self-efficacy, Spirituality, doctor's communication skills, social support from significant others, family and friends on medication adherence revealed a significant regression equation [ $F_{(7, 345)} = 85.04$ ,  $p = .001$ ] with  $R^2$  of .638. This means that HIV-related stigma, General self-efficacy, Spirituality, doctor's communication skills, social support from significant others, family and friends made a significant contribution in explaining (63.8%) of the variance in medication adherence.

**Hypothesis 1:** Patient spirituality will have a significant negative relationship with medication adherence.

As shown in Table 4, patient's spirituality had a significant negative correlation with medication adherence ( $\beta = -.26, p = .001$ ). This means that the higher a patient's spirituality is the less likely he/she will be adherent to HIV medications. Therefore hypothesis one was supported by the data in the current study.

**Hypothesis 2:** Doctor's communication skills will have a significant positive relationship with medication adherence.

As shown in Table 4, doctors-patient communication had a significant positive correlation with medication adherence ( $\beta = .39, p = .001$ ). This means that the higher a patient rates his/her HIV doctor's communication skills towards him/her the more adherent he/she becomes to HIV medications. Therefore hypothesis three was supported by the data in the current study.

**Hypothesis 3:** Patient's general self-efficacy will have a significant positive relationship with medication adherence.

As shown in Table 4, patient's general self-efficacy did not have a significant positive correlation with medication adherence but rather a negative relationship ( $\beta = -.17, p = .00$ ). This means that the higher a patient general efficacy the less likely he will adhere to HIV medications, therefore hypothesis four was not supported by the data from the study.

**Hypothesis 4:** HIV related stigma will have a significant negative relationship with medication adherence.

As shown in Table 4, HIV-related stigma had a significant negative correlation with medication adherence ( $\beta = -.33, p = .001$ ). This means that the higher a patient experiences HIV-related stigma, the less likely he/she will adhere to HIV medications. Therefore hypothesis four was supported by the data in the current study.

**Hypothesis 5:** Patients' with strong perceived social support from significant others, family and friends will have a significantly higher medication adherence than those without perceived social support from significant others, family and friends.

As shown in Table 4, perceived social support from significant others had a significant positive correlation with HIV medication adherence ( $\beta = .42, p = .01$ ). Perceive social support from family and friends did not have significant effect on HIV medication adherence ( $\beta = .42, p = .090$ ) and ( $\beta = -.14, p = .16$ ) respectively. This means that only patients with perceived social support from significant others were significantly adhering to HIV medications; therefore hypothesis six was partly supported by the data in the current study.

**Hypothesis 6:** Women will score significantly higher on medication adherence than men.

Table 5

*Summary of the Independent t-test comparing males and females on medication adherence*

	Gender.	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Df</i>	<i>t</i>	<i>p</i>
Medication adherence	Male	173	11.14	5.24	347	-1.00	.316
	Female	176	11.70	5.09			



The results from Table 5 show that the mean difference between males and females was statistically nonsignificant [ $t(347) = -1.003, p = .316$ ]. Therefore, the hypothesis that “women will score higher on medication adherence than men” was not supported.

## **CHAPTER FIVE**

### **DISCUSSION, CONCLUSION, AND RECOMMENDATIONS**

#### **5.0 Introduction**

The aim of the study was to investigate predictors of medication adherence among people living with HIV in the Ashanti region. Accordingly, six (6) research hypotheses were formulated. The hypotheses were; (1) Patients spirituality will have a significant negative relationship with medication adherence, (2) Women will score significantly higher on medication adherence than men, (3) Doctors' communication skills will have a significant positive relationship with medication adherence. Results from the study are discussed as well as their practical implications. The limitations and recommendations for future studies have also been presented in this chapter. The chapter ends with a conclusion which highlights the main issues in the study.

#### **5.1 Spirituality and medication adherence**

The researcher proposed that spirituality will have a significant negative relationship with medication adherence. Findings from the study confirmed this hypothesis, as spirituality had a significant negative relationship with medication adherence. This finding is consistent with previous researches (e.g., Kremer et al., 2019; Finocchiaro-Kessler et al., 2011; Igbende et al., 2016) that have indicated that participants who were highly spiritual were less adherent to their HIV medication. It has been found that an individual's belief in the supernatural causes of illness and healing tends to influence his or her beliefs about the role of medication in the management of HIV/AIDS, which in turn may influence adherence to medication. For example, in Kremer and colleagues' study, participants reported that they believed God has power and controls health and thus believed if they did not take their medication they would be okay. Furthermore, Wanyama et al. (2007) found that patients stopped taking their medication because they believed

they have been cured of their HIV infection after they received prayer from their religious leaders. Kretchy et al. (2013) said it more likely for people who are highly spiritual to believe that their health predicament can be healed by their supreme being and hence may not take medication. Culturally, Ghanaians are noted to be spiritual and their spirituality transcends every aspect of their life. The thought of Spiritual involvement in HIV infection would not be far-fetched from a highly spiritual Ghanaian who lives in the rural area. Spirituality gives a sense of inner strength to people and they are likely to believe that even if they don't take the medication nothing can happen to them (Kremer et al., 2019). They may also attribute everything that happens to them as destined to happen and that human can do nothing to avert it. This can reduce their health-seeking behavior and hence make them non-adherent to ARVs. This finding is contrary to what Tumwine et al. (2012) and Parson et al. (2006) found in their respective studies in which patients who were very spiritual had improved medication adherence. These studies were not conducted in Africa, and hence cultural differences in the setting of the research may account for the differences observed in the study.

## **5.2 Doctors communication skills and patients medication adherence**

The researcher proposed that doctor-patient communication will have a significant positive relationship with medication adherence. Findings from the study supported this hypothesis as doctors-patient communication was a significant positive predictor of medication adherence. This means that the more a patient feels his or her doctor is communicating well with him/her, the more he/she becomes adherent to medications. This finding is supported by what Amin et al. (2019), Martini et al. (2002) and Bakken et al. (2000) found in their respective studies, where patients who were satisfied with how their clinicians treated them were more adherent to medication. According to Dapaah, (2016), Ghanaians are very particular when it

comes to how people communicate to them. This is because they interpret the way people communicate with them to mean whether they respect them or not. Friedman et al. (2008) stated that, without good communication from healthcare providers, patients may be unable to bring out their concerns and this will bring dissatisfaction to them and affect adherence. Communication skills are therefore an important quality when it comes to professionals who have a day-to-day encounter with people (Stavropoulou, 2008). This is because the way health practitioners communicate to patients reveals whether they respected, cared for or their concerns were valued (Martini et al., 2000). In healthcare settings and in HIV clinical care, the way a doctor and other healthcare providers communicate with their patients is very critical to the holistic care that patients receive (Stavropoulou, 2008). HIV patients are particularly sensitive to how their doctors treat them because of the stigma that comes with the disease as reported by Dapaah (2016). HIV medication adherence can be affected in several ways when doctors communicate or interact poorly with patients. First, patients will not be able to voice out their concerns to their doctors which include revealing medication side effects for them to be reassured, or for medication change to be considered by the doctor (Dapaah, 2016). They will rather stop taking the medications on their own. It can also lead to miscommunication of review dates and patients defaulting on treatment (Amin et al., 2019).

### **5.3 General self-efficacy and medication adherence**

The ability of an individual to believe in his or her capabilities to complete a given task, which is the hallmark of self-efficacy (Bandura, 1997). Medication self-efficacy means that when HIV patients are put on medication, they should follow through with the treatment plan. The researcher hypothesized that self-efficacy will have a positive relationship with HIV medication adherence. Findings from the study did not support this hypothesis as self-efficacy

had a negative relationship with HIV medication adherence. This means that patients who reported that they had high self-efficacy were mostly nonadherent, contrary to what would have been expected. Findings from the study are consistent with what Vancouver et al. (2008) found in their study where self-efficacy was negatively related to goal striving. This result is however contrary to what Colbert et al. (2013), Kerr et al. (2004) and Johnson et al. (2006) found in their study in which self-efficacy was positively associated with medication adherence. This could be so because self-efficacy in one particular area of life is not an assurance that it will be useful in other aspects of life (Vancouver et al., 2008). Hence, it is also a domain-specific form of self-confidence (Vancouver et al., 2008). Self-efficacy can also be a problem to HIV medication adherence when the individual believes that his/her HIV infection was due to the work of some supernatural forces, hence he or she may decide to seek for solutions elsewhere (Igbende et al., 2016). When this is the case, people with high self-efficacy will make sure that they carry through with their decision no matter what. This would not be something that will be far-fetched considering the socio-cultural context of the participants used in this study, where spirituality plays a key role in their lives. Also, these patients may decide to try other medication other than what is been prescribed to them such as herbal medication (Wayama et al., 2007).

People with high self-efficacy will make sure they follow through until the end to see what will happen. These dynamics can make uninformed patients with high self-efficacy not to be strict adherent to HIV medication. Lastly, this can also be explained by the health belief model and the socio-cognitive theory (Bandura, 1989, Glanz et al., 2010). In SCT perspective, medication adherence is not a function of only one factor but a combination of factors which interact to determine whether a person adheres to a treatment plan or not (Bandura, 1989). So this means that a person could have high self-efficacy but if other factors are not favourable, they

may not adhere to a treatment plan. Again, the health belief model postulates that health behavior is mainly determined by personal beliefs or perceptions about a condition/disease and the available strategies to decrease its occurrence (Glanz et al., 2010). Therefore, if the person does not perceive the condition to be serious, it can also affect the way he or she takes their medication

#### **5.4 HIV-related stigma and medication adherence**

The researcher proposed that HIV-related stigma will have a negative relationship with medication adherence. Findings from the study support this hypothesis, which means that HIV patients who are stigmatized are less likely to adhere to their HIV medication. This finding is supported by what Li et al. (2011), Okoror et al. (2013), Stetterheim et al. (2009) and Taylor et al. (2014) found in their various studies, where HIV-related stigma negatively impacted on medication adherence. This is so because patients with HIV infection who are at high risk of stigma are likely to hide their medication from where people can see, which can affect how they will remember to take it themselves. They are also more likely to stop taking their medication when they experience side effects because they don't want people to know they are taking any medication. HIV-related stigma is one of the major reasons why HIV patients do not adhere to HIV medication. This is because when people feel stigmatized, they take measures to avoid the source of stigma. Stigma could come from various sources including healthcare providers such as nurses and even the HIV clinic itself. When HIV clinics are located in a place visible to the general public, anyone to and fro the clinic is perceived to have HIV. This situation can put a lot of stress on HIV patients when it gets to the time they have to go for their medication. When people get to know that a particular trader has HIV, they can stop buying things from the person, which can make it difficult for the person to get money to go for his/her medication regularly.

### **5.5 Perceived social support and medication adherence**

In this study, it was proposed that perceived social support from family, friends and significant others will each have a positive relationship with HIV medication adherence. Findings from the study showed that only perceived social support from significant others had a significant positive relationship with HIV medication adherence. The other forms of perceived social support such as family and friends did not have a significant relationship with medication adherence. The positive relationship between social support from significant others and medication adherence is consistent with what Rabinovitch et al. (2009), Bolkan et al. (2013) as well as Razali et al. (2014) who also found social support from significant others to improve adherence. They, however, also found the significant result for family and friends which is contrary to what this study found, where the relationship was not significant. This is so because significant others maybe people who might not necessarily be family members or friends but have earned the trust of the patient and hence the client takes advice from them very seriously. These people could be pastors, HIV social support groups like National Association of People Living with HIV/AIDS (NAPLAS) or even individuals who are also HIV infected in the community and hence are living testimonies to the importance of adhering to HIV medication. Many other patients, for the fear of stigma from family and friends, may not have disclosed their HIV status to them and hence may not have the necessary support from them when it comes to taking their medications.

### **5.6 Gender and medication adherence**

The researcher hypothesized that women will be significantly more adherent to HIV medication than men. Findings from the study did not show a significant difference in adherent behaviour between men and women in HIV medication. This could be because HIV awareness

and education over the years about the importance of taking your HIV medication in order to be strong and healthy have informed men and women equally on the importance of taking their medication. Moreover, before HIV patients are enrolled on HAART, they are taken through medication adherence counselling, where the benefits of taking the medication as well as complications of not taking the medication are explained to them. This is done for both men and women and this may explain why there are no significant differences in adherence. Also since HIV normally infects couples together; it makes each other serve as a check on the other to take their medication to achieve viral suppression together. This finding is contrary to what Turner, Laine, Losler, and Hauck (2003) found in their study in which women were significantly less adherent to medication than men were. These differences in results could be attributed to setting and cultural differences among participants in both studies.

### **5.7 Limitation of the study and suggestions for future studies**

As with many studies, there are certain limitations to the findings from this study that are worth noting. First, the study was conducted in a hospital whose patients mostly comes from rural communities and villages, therefore findings may not necessarily reflect the views of patients with different sociodemographic characteristics.

Secondly, Patients below age 18 years were not considered for the current study, so findings discussed in this study exclude that of patients in this age population.

Thirdly, the study was purely a quantitative one, hence findings were discussed based on cultural and theoretical background.

Based on the findings and certain limitations of the current study, the following recommendations are been made;



Firstly, future studies should consider using participants from both rural and urban areas to compare and see how these relationships will differ per where the participants are coming from, and with patients from such a diverse background will help to generalize findings.

Secondly, future studies should consider an explanatory sequential mixed method to be able to find answers to how these relationships are existing between the study variables.

### **5.8 Recommendations for practice**

Based on the findings from the study the following recommendations are made;

1. There should be a continual training workshop for doctors and other clinicians on how to improve their communication skills with HIV patients since this can have a great impact on their medication adherence.
2. There should be continual public education on HIV/AIDS, the mode of transmission and disease process as this will help sensitizing the populace on HIV and reduce stigma.
3. Clinical psychologists should be engaged in HIV clinics to help use cognitive therapy techniques to change HIV seropositive patients' attitudes and belief about a spiritual cure and help them to adhere to the management plan.
4. Governmental agencies such as National Commission on Civic Education as well as non-governmental organizations should embark on HIV/AIDS enlightenment campaigns to educate spiritual leaders and their followers on the importance of developing positive attitude and mentality towards clinical management of HIV/AIDS

### **5.9 Conclusion**

Human Immune Virus (HIV) is a virus that attacks and subsequently destroys a person immune system particularly a T-lymphocytes known as the T-helper cells or CD4+ cells. As the

infection progresses the patient becomes severely immunocompromised and opportunistic infections begin to set in. With the emergence of the Highly Active Antiretroviral Therapy, which interferes with HIV viral replication and hence reduces the viral load and improves the CD4 count of the infected person. This helps HIV patients to live longer and healthier lives.

This study was designed to find out some predictors of medication adherence among people living with HIV in the Ashanti region. The study sampled 349 participants who have been diagnosed with the HIV virus and are receiving clinical care. Participants' spirituality, general self-efficacy, perceived social support, HIV-related stigma as well as doctor-patient communication were measured and how these variables influence how they take the HIV medications were assessed. In addition, gender differences in medication adherence were also assessed.

Findings showed that doctor-patient communication and perceived social support from significant others were positively related to HIV medication adherence while spirituality, general self-efficacy, and HIV-related stigma had a negative relationship with medication adherence. Gender difference, perceived social support from family and friends did not have any significant impact on HIV medication adherence in the current study. In practice, the goal is to promote conditions that will favour medication adherence among HIV patients and mitigate factors that hinder proper medication adherence. This study has shown that the way clinicians especially doctors communicate to HIV patients have a great impact on their medication adherence, hence appropriate awareness and training should be provided to help doctors improve on their communication skills with HIV patients.

It was also evident from the findings that HIV-related stigma was negatively associated with medication adherence, this means HIV service providers should provide psychological support for patients to help them build resilience to deal with stigma. Again, organizations like the Ghana Aids Commission and National AIDS Commission Programme should increase HIV/AIDS educational programmes to help educate the populace on HIV/AIDS. Finally, Health service providers especially those providing HIV/AIDS services should screen to see the spirituality, perceived social support and general self-efficacy of the patients and determine whether this will in any way affect their adherence to medication and educate them accordingly.

## **References**

Abdulai, D. N. (2016). African-centered management education: A new paradigm for an emerging continent. *Routledge*, 47(7), 321- 325

- Abrokwah, B. J. (2018). *Factors associated with Antiretroviral Therapy adherence amongst men who have sex with men in selected facilities* (Doctoral dissertation), University of Ghana, Legon.
- Adefolalu, A., Nkosi, Z., Olorunju, S., & Masemola, P. (2014). Self-efficacy, medication beliefs and adherence to antiretroviral therapy by patients attending a health facility in Pretoria. *South African Family Practice*, 56(5), 281-285.
- Amin, Z., Kabir, M., Karami, J., & Nahar, N. (2019). Doctor-Patient communication to improve adherence to antihypertensive treatment. *Bangladesh Medical Research Council Bulletin*, 44(3), 145-151. doi.org/10.3329/bmrcb.v44i3.39938
- Ankrah, D. N. A., Lartey, M., Agyepong, I., Leufkens, H. G. M., & Mantel-Teeuwisse, A. K. (2015). Adherence and treatment change among HIV/AIDS patients in Ghana-a nested case control study. *Journal of AIDS and Clinical Research*, 6(10).
- Annison, L., Dompok A., & Adu-Sarkodie, Y. (2013). The immunological response of HIV-positive patients initiating HAART at the Komfo Anokye Teaching Hospital, Kumasi, Ghana. *Ghana Medical Journal*. 47(4), 164-170.
- Anude, C.J., Eze, E., & Onyegbutulem H.C. (2013) Immuno-virologic outcomes and immuno-virologic discordance among adults alive and on anti-retroviral therapy at 12 months in Nigeria. *BMC Infect Dis*, 34(5), 13-113.
- Aragonés, C., Sánchez, L., Campos, J. R., & Pérez, J. (2011). Antiretroviral therapy adherence in persons with HIV/AIDS in Cuba. *MEDICC Review*, 13(2), 17-23.
- Aregbesola, O. H., & Adeoye, I. A. (2018). Self-efficacy and antiretroviral therapy adherence among HIV positive pregnant women in South-West Nigeria: a mixed methods study. *Tanzania Journal of Health Research*, 20(4).

- Ashton, L. J., Smith, D. G., Ziegler, J. B., Kaldor, J. M., Cooper, D. A., & Ffrench, R. A. (2003). Effector HIV-specific cytotoxic T-lymphocyte activity in long-term nonprogressors: Associations with viral replication and progression. *Journal of Medical Virology*, *71*(4), 483-491.
- Bakken, S., Holzemer, W. L., Brown, M. A., Powell-Cope, G. M., Turner, J. G., Nokes, K. M., & Corless, I. B. (2000). Relationships between perception of engagement with health care provider and demographic characteristics, health status, and adherence to therapeutic regimen in persons with HIV/AIDS. *AIDS Patient Care STDS*, *14*(5), 189–197.
- Balthip, K., McSherry, W., & Nilmanat, K. (2017). Spirituality and dignity of thai adolescents living with HIV. *Religions*, *8*(12),257.
- Balthip, Q., Petchruschatachart, U., Piriyaakontorn, S., & Boddy, J. (2013). Achieving peace and harmony in life: T hai B uddhists living with HIV/AIDS. *International Journal of Nursing Practice*, *19*(4), 7-14.
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, *44*(9), 1170-1175.
- Bisson, G. P. (2008). Pharmacy refill adherence compared with CD4 count changes for monitoring HIV-infected adults on antiretroviral therapy. *PLoS Med.* **5**, e109
- Boakye, H. A. (2015). *Predictors of contraceptive utilization among HIV positive women in Kumasi Metropolis Ghana* (Doctoral dissertation). University of Ghana, Legon.

- Boggs, W. (2007). Direct administration of antiretroviral therapy improves HIV outcomes. *Clin Infect Dis*, 45(6), 770-8.
- Bolkan, C. R., Bonner, L. M., Campbell, D. G., Lanto, A., Zivin, K., Chaney, E., & Rubenstein, L. V. (2013). Family involvement, medication adherence, and depression outcomes among patients in veterans affairs primary care. *Psychiatric Services*, 64(5), 472-478.
- Brown, C. S. (2015). *The educational, psychological, and social impact of discrimination on the immigrant child*. Washington, DC: Migration Policy Institute.
- Brown, K. (2015). *Vulnerability and young people: Care and social control in policy and practice*. Policy Press.
- Carter, M. (2004). Adherence. *Aidsmap Patient Information*. Accessed on 9 June 2018 from [www.aidsmap.com](http://www.aidsmap.com)
- Cobblah, P. (2016). Factors Influencing Adherence to Antiretroviral Therapy among Persons Living with HIV in Accra Metropolis (Doctoral dissertation). University of Ghana, Legon.
- Colbert, A. M., Sereika, S. M., & Erlen, J. A. (2013). Functional health literacy, medication-taking self-efficacy and adherence to antiretroviral therapy. *Journal of Advanced Nursing*, 69(2), 295-304.
- Conde, P., Alonso, T., Garau, I., Roca, P., & Oliver, J. (2006). Treatment of medical databases and their graphical representation on the Internet. *Informatics for Health and Social Care*, 31(3), 195–204. doi.org/10.1080/14639230600804879

- Cotton, S., Tsevat, J., Szaflarski, M., Kudel, I., Sherman, S. N., Feinberg, J., Leonard, A.C., & Holmes, W. C. (2006). Changes in Religiousness and Spirituality Attributed to HIV/AIDS: Are there Sex and Race Differences? *Journal of General Internal Medicine*, *21*(5), S14–S20.
- Creswell, J. W., & Garrett, A. L. (2008). The “movement” of mixed methods research and the role of educators. *South African Journal of Education*, *28*(3), 321-333.
- Dapaah, J. M. (2016). Attitudes and behaviours of health workers and the use of HIV/AIDS health care services. *Nursing Research and Practice*, *20*(16).
- Delaney, C. (2003). The spirituality Scale: Development, Refinement and Psychometric Testing of an Instrument to Assess the Human Spiritual Dimension. *Journal of Holistic Nursing*, *5*(15), 2123-3424
- Dowshen, N., Binns, H. J., & Garofalo, R. (2009). Experiences of HIV-related stigma among young men who have sex with men. *AIDS Patient Care and STDs*, *23*(5), 371-376.
- Dworkin, M. S., Chakraborty, A., Zychowski, D., Donenberg, G., Novak, R., & Garofalo, R. (2018). Self-efficacy and ability to read as factors associated with antiretroviral therapy adherence in an HIV-infected population. *International Journal of STD & AIDS*, *29*(12), 1154–1164. doi.org/10.1177/0956462418776073
- Erah, P. O., & Arute, J. E. (2008). Adherence of HIV/AIDS patients to antiretroviral therapy in a tertiary health facility in Benin City. *African Journal of Pharmacy and Pharmacology*, *2*(7), 145-152.

- Essel, A. P. (2018). *Factors Affecting Adherence to Anti-Retroviral Therapy among Women in Selected Health Facilities in the Greater Accra Region* (Doctoral dissertation), University of Ghana, Legon.
- Fernandez, S., Chaplin, W., Schoenthaler, A. M., & Ogedegbe, G. (2008). Revision and validation of the medication adherence self-efficacy scale (MASES) in hypertensive African Americans. *Journal of Behavioral Medicine, 31*(6), 453-462.
- Field, A. (2009). *Discovering Statistics Using SPSS*, Third Edition.
- Fairall, L.R., Bachmann, M.O., & Louwagie G.M. (2008) Effectiveness of antiretroviral treatment in South African program: a cohort study. *Arch Intern Med, 16*(8), 86 – 93.
- Finocchiaro-Kessler, S., Catley, D., Beckley-Patton, J. Gerkovich, M. Williams, K., Banderas, J. & Goggin, K. (2011). Baseline Predictors of Ninety percent or Higher Anti-retroviral therapy in a Diverse Urban Sample: The Role of Patient Autonomy and Fatalistic Religious Beliefs. *AIDS Patient Care and STDS, 24*(5), 103–111.
- Friedman, J. (2008). Epigenetic silencing of human immunodeficiency virus (HIV) transcription by formation of restrictive chromatin structures at the viral long terminal repeat drives the progressive entry of HIV into latency. *Journal of Virology, 82*(24), 12291-12303.
- Gardner, E. M., Burman, W. J., Steiner, J. F., Anderson, P. L., & Bangsberg, D. R. (2009). Antiretroviral medication adherence and the development of class-specific antiretroviral resistance. *AIDS (London, England), 23*(9), 1035.
- Ghana AIDS Commission, (2009). *HIV situation in Ghana*. Ghana Aids Commission.



- Ghana AIDS Commission. (2015). Summary of the 2013 HIV sentinel survey report. *Retrieved from the Ghana AIDS Commission website at [http://ghanaidc.gov.gh/gac1/aids\\_info.php](http://ghanaidc.gov.gh/gac1/aids_info.php) on May, 31, 2016.*
- Glanz, K., & Bishop, D. B. (2010). The role of behavioral science theory in development and implementation of public health interventions. *Annual review of public health, 31*, 399-418.
- Haas, A. D. (2016). Adherence to Antiretroviral Therapy During and After Pregnancy: Cohort Study on Women Receiving Care in Malawi's Option B+ Program. *Clin Infect Dis. 63*, 1227–1235
- Hardon, A. P., Akurut, D., Comoro, C., Ekezie, C., Irunde, H. F., Gerrits, T., & Moroka, T. M. (2007). Hunger, waiting time and transport costs: time to confront challenges to ART adherence in Africa. *AIDS Care, 19*(5), 658-665.
- Igbende, D., Ogwuche A., Atsehe H. (2016). "Antiretroviral Treatment Adherence Among Patients in Selected Health Facilities in East London, South Africa: A Cross-Sectional Study." *Online Journal of Health and Allied Sciences, 1* (24).
- Jackson, F. (2005). HIV knowledge, perceived seriousness and susceptibility, and risk behaviors of older African Americans. *Journal of Multicultural Nursing & Health, 11*(1), 56.
- Johnson, M. O., Chesney, M. A., Goldstein, R. B., Remien, R. H., Catz, S., Gore-Felton, C., & Morin, S. F. (2006). Positive provider interactions, adherence self-efficacy, and adherence to antiretroviral medications among HIV-infected adults: A mediation model. *AIDS Patient Care & STDs, 20*, 258-268. [dx.doi.org/10.1089/apc.2006.20.258](https://doi.org/10.1089/apc.2006.20.258)

- Katz, I. T., Ryu, A. E., Onuegbu, A. G., Psaros, C., Weiser, S. D., Bangsberg, D. R., & Tsai, A. C. (2013). Impact of HIV-related stigma on treatment adherence: systematic review and meta-synthesis. *Journal of the International AIDS Society*, 16(Suppl 2):18640.
- Kerr, T., Palepu, A., Barnes, G., Walsh, J., Hogg, R., Montaner, J., Wood, E. (2004). Psychosocial determinants of adherence to highly active antiretroviral therapy among injection drug users in Vancouver. *Antiviral Therapy*, 9, 407–414.
- Koenig, H., Koenig, H. G., King, D., & Carson, V. B. (2012). *Handbook of religion and health*. Oup Usa.
- Kretchy, I., Owusu-Daaku, F., & Danquah, S. (2013). Spiritual and religious beliefs: do they matter in the medication adherence behaviour of hypertensive patients?. *BioPsychoSocial Medicine*, 7, (2).
- Kremer, H., Ironson, G., & Porr, M. (2009). Spiritual and mind-body beliefs as barriers and motivators to HIV-treatment decision-making and medication adherence? A qualitative study. *AIDS Patient Care STDS*, 23(2), 127-134.
- Krishna H., McAllister, D. A., O'Brien, K. L., Simoes, E. A., Madhi, S. A., Gessner, B. D., & Alassani, I. (2017). Global, regional, and national disease burden estimates of acute lower respiratory infections due to respiratory syncytial virus in young children in 2015: a systematic review and modelling study. *The Lancet*, 390(10098), 946-958.
- Li, X., Huang, L., Wang, H., Fennie, K. P., He, G., & Williams, A. B. (2011). Stigma mediates the relationship between self-efficacy, medication adherence, and quality of life among people living with HIV/AIDS in China. *AIDS Patient Care and STDs*, 25(11), 665-671.

- Logie, C., & Gadalla, T. M. (2009). Meta-analysis of health and demographic correlates of stigma towards people living with HIV. *AIDS Care*, 21(6), 742-753.
- Luszczynska, A., Sarkar, Y., & Knoll, N. (2007). Received social support, self-efficacy, and finding benefits in disease as predictors of physical functioning and adherence to antiretroviral therapy. *Patient Education and Counseling*, 66(1), 37-42.
- Lyimo, R. A., Stutterheim, S. E., Hospers, H. J., de Glee, T., van der Ven, A., & de Bruin, M. (2014). Stigma, disclosure, coping, and medication adherence among people living with HIV/AIDS in Northern Tanzania. *AIDS Patient Care and STDs*, 28(2), 98-105.
- Machtinger, E. L., & Bangsberg, D. R. (2005). Adherence to HIV antiretroviral therapy. *HIV Insite Knowledge Base Chapter*. USA
- MacQuarie K, Eckhaus T, & Nyblade L. (2009). HIV-related stigma and discrimination: A summary of recent literature”. *AIDS Care*, 16(4), 471-484.
- Mahajan, A. P., Sayles, J. N., Patel, V. A., Remien, R. H., Ortiz, D., Szekeres, G., & Coates, T. J. (2008). Stigma in the HIV/AIDS epidemic: a review of the literature and recommendations for the way forward. *AIDS (London, England)*, 22(Suppl 2), S67-79.
- Mao, Y., Li, X., Qiao S., Zhou Y., Zhao Q. (2017) Ethnicity, Stigma and Adherence to Antiretroviral Therapy (ART) among People Living with HIV/ AIDS in Guangxi, China. *J AIDS Clin Res*, 8(65). doi: 10.4172/2155-6113.1000652
- Martini, M., Parazzini, F., and Agnoletto, V. (2002). Adherence to HIV treatment: Results from a 1-year follow-up study. *HIV Medicine*, 3, 62–64.
- Melrose, K. L., Brown, G. D., & Wood, A. M. (2015). When is received social support related to perceived support and well-being? When it is needed. *Personality and Individual Differences*, 77, 97-105.

- Mbiti, J. S. (1975). *The prayers of African religion* (p. 157). London: SPCK.
- Moore, R. D., & Keruly, J. C. (2007). CD4+ cell count 6 years after commencement of highly active antiretroviral therapy in persons with sustained virologic suppression. *Clinical Infectious Diseases*, 44(3), 441-446.
- Murphy, D. A., Marelich, W. D., Hoffman, D., & Steers, W. N. (2004). Predictors of antiretroviral adherence. *AIDS Care*, 16(4), 471-484.
- NACP. (2010). *Report on the care and treatment of HIV in Tanzania 2010. National AIDS Control Programme*. Dar es Salaam.
- Nakiyemba, A., Aurugai, D. A., Kwasa, R., & Oyabba, T. (2006). Factors that facilitate or constrain adherence to antiretroviral therapy among adults in Uganda: A pre-intervention study. *From access to adherence: the challenges of antiretroviral adherence*. Geneva: WHO, 236-301.
- Obirikorang, C., Selleh, P. K., Abledu, J. K., & Fofie, C. O. (2013). Predictors of adherence to antiretroviral therapy among HIV/AIDS patients in the upper west region of Ghana. *Isrn Aids*, 2013.
- O'Connor, W. G., Rogers, A. B., Willis, M. S., & Essop, M. F. (2013). Cardio-metabolic effects of HIV protease inhibitors (lopinavir/ritonavir). *PloS One*, 8(9), e73347.
- Ohene, S., & Forson, E. (2009). Care of patients on anti-retroviral therapy in Kumasi Metropolis. *Ghana Medical Journal*, 43(4), 144.
- Ohene, S.A., Addo, N. A., Zigah, F., Newman, M., Lartey, M., Romero, M.A., Ofori, S., Sheriff, T. & Ndanu, T. (2013). Evaluation of antiretroviral therapy (ART) provision in an early cohort of patients initiating ART in Ghana. *Pan African Medical Journal*; 16:117.

- Okoror, T. A., Falade, C. O., Walker, E. M., Olorunlana, A., & Anaele, A. (2016). Social context surrounding HIV diagnosis and construction of masculinity: a qualitative study of stigma experiences of heterosexual HIV positive men in southwest Nigeria. *BMC Public Health, 16*(1), 507.
- Olusengu, O. E., Elegbede, O. T., Agboola, S. M., Isinkaye, A. O., & Omopariola, O. A. (2014). Effects of stigmatization/discrimination on antiretroviral therapy adherence among HIV-infected patients in a rural tertiary medical center in Nigeria. *Journal of the International Association of Providers of AIDS Care (JIAPAC), 13*(3), 260-263.
- Oshotse, C., Zullig, L. L., Bosworth, H. B., Tu, P., & Lin, C. (2018). Peer Reviewed: Self-Efficacy and Adherence Behaviors in Rheumatoid Arthritis Patients. *Preventing Chronic Disease, 15*.
- Parker, M. M. (2005). Evaluation of dried blood spot specimens for HIV-1 drug-resistance testing using the Trugene HIV-1 genotyping assay. *Journal of Clinical Virology, 41*(4), 283-287.
- Parsons, S. K., Cruise, P. L., Davenport, W. M., & Jones, V. (2006). Religious beliefs, practices and treatment adherence among individuals with HIV in the southern United States. *AIDS Patient Care STDS, 20*(2), 97-111.
- Portelli, J., Michotte, Y., & Smolders, I. (2012). Ghrelin: an emerging new anticonvulsant neuropeptide. *Epilepsia, 53*(4), 585-595.
- Proeschold-Bell, R. J., Yao, J., LeGrand, S., Uehara, A., Asiimwe, E., & Quinlivan, E. B. (2013). Three types of self-efficacy associated with medication adherence in patients with co-occurring HIV and substance use disorders, but only when mood disorders are present. *Journal of Multidisciplinary Healthcare, 6*, 229.

- Puchalski, C. M., Vitillo, R., Hull, S. K., & Reller, N. (2014). Improving the spiritual dimension of whole person care: reaching national and international consensus. *Journal of Palliative Medicine, 17*(6), 642-656.
- Rabinovitch, M., Bécharde-Evans, L., Schmitz, N., Joobar, R., & Malla, A. (2009). Early predictors of nonadherence to antipsychotic therapy in first-episode psychosis. *The Canadian Journal of Psychiatry, 54*(1), 28-35.
- Razali, S. M., & Yusoff, M. Z. A. M. (2014). Medication adherence in schizophrenia: a comparison between outpatients and relapse cases. *East Asian Archives of Psychiatry, 24*(2), 68.
- Reif, S., Proeschold-Bell, R. J., Yao, J., Legrand, S., Uehara, A., Asimwe, E., & Quinlivan, E. B. (2013). Three types of self-efficacy associated with medication adherence in patients with co-occurring HIV and substance use disorders, but only when mood disorders are present. *Journal of Multidisciplinary Healthcare, 6*, 229–237.  
doi:10.2147/JMDH.S44204
- Ruanjahn, G., Roberts, D., & Monterosso, L. (2010). An exploration of factors influencing adherence to highly active anti-retroviral therapy (HAART) among people living with HIV/AIDS in Northern Thailand. *AIDS Care, 22*(12), 1555–1561.  
<http://doi.org/10.1080/09540121003759901>
- Sabaté, E., (2003). *Adherence to long-term therapies: evidence for action*. World Health Organization.

- Safren, S. A., Gershuny, B. S., & Hendriksen, E. (2014). Symptoms of posttraumatic stress and death anxiety in persons with HIV and medication adherence difficulties. *AIDS Patient Care and STDs*, 17(12), 657-664.
- Samji, H., Cescon, A., Hogg, R. S., Modur, S. P., Althoff, K. N., Buchacz, K., ... & Justice, A. (2013). Closing the gap: increases in life expectancy among treated HIV-positive individuals in the United States and Canada. *PloS one*, 8(12), e81355.
- Shay, J. W., & Keith, W. N. (2008). Targeting telomerase for cancer therapeutics. *British Journal of Cancer*, 98(4), 677.
- Stavropoulos, A. (2008). Long-term exposure to medium-dose glucocorticoid therapy associates with hypertension in patients with rheumatoid arthritis. *Rheumatology*, 47(1), 72-75.
- Steiner, J. F., & Earnest, M. A. (2000). Lingua medica: the language of medication-taking. *Ann Intern Med*, 132(11), 926-930
- Stutterheim, S. E., Pryor, J. B., Bos, A. E., Hoogendijk, R., Muris, P., & Schaalma, H. P. (2009). HIV-related stigma and psychological distress: the harmful effects of specific stigma manifestations in various social settings. *Aids*, 23(17), 2353-2357.
- Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol. 5). Boston, MA: Pearson.
- Taylor, B. S., Reyes, E., Levine, E. A., Khan, S. Z., Garduno, L. S., Donastorg, Y., & Hirsch, J. S. (2014). Patterns of geographic mobility predict barriers to engagement in HIV care and antiretroviral treatment adherence. *AIDS Patient Care and STDs*, 28(6), 284-295.

- Thompson, K., Kulkarni, J., & Sergejew, A. A. (2000). Reliability and validity of a new Medication Adherence Rating Scale (MARS) for the psychoses. *Schizophrenia Research*, 42, 241-247. [https://doi.org/10.1016/S0920-9964\(99\)00130-9](https://doi.org/10.1016/S0920-9964(99)00130-9)
- Tumwine, C., Neema, S., & Wagner, G. (2012). Reasons why high religiosity can co-exist with and precipitate discontinuation of anti-retroviral therapy among different HIV clients in Uganda: an exploratory study. *Religions*, 3(3), 817-832.
- Turner, B. J. (2002). Adherence to antiretroviral therapy by human immunodeficiency virus-infected patients. *J Infect Dis*. **185**, S143–S151
- Turner, B. J., Laine, C., Cosler, L., & Hauck, W. W. (2003). Relationship of gender, depression, and health care delivery with antiretroviral adherence in HIV-infected drug users. *Journal of General Internal Medicine*, 18(4), 248-257.
- UNAIDS, W. (2014). Fact Sheet: World AIDS Day 2014. *Global HIV statistics*.
- UNAIDS, W. (2016). Fact Sheet: World AIDS Day 2016. *Global HIV statistics*.
- UNAIDS, W. (2018). Fact Sheet: World AIDS Day 2018. *Global HIV statistics*.
- Vancouver, J. B., More, K. M., & Yoder, R. J. (2008). Self-efficacy and resource allocation: support for a nonmonotonic, discontinuous model. *Journal of Applied Psychology*, 93(1), 35.
- Wang, Q., Ding, Z. H., Liu, J. K., & Zheng, Y. T. (2004). Xanthohumol, a novel anti-HIV-1 agent purified from Hops *Humulus lupulus*. *Antiviral research*, 64(3), 189-194.



- Wanyama, J., Castelnovo, B., Wandera, B., Mwebaze, P., Kambugu, A., Bangsberg, D. R & Amya, M. R. (2007) Belief in Divine Healing Can be a Barrier to Antiretroviral Therapy Adherence in Uganda. *AIDS*, 21: 1486–1487.
- Warren-Findlow, J., & Seymour, R. B. (2011). Prevalence rates of hypertension self-care activities among African Americans. *Journal of the National Medical Association*, 103(6), 503-512.
- Wools-Kaloustian, K., Kimaiyo, S., Diero, L., Siika, A., Sidle, J., Yiannoutsos, C. T., & Tierney, W. M. (2006). Viability and effectiveness of large-scale HIV treatment initiatives in sub-Saharan Africa: experience from western Kenya. *Aids*, 20(1), 41-48.
- World Health Organization. (2004). *World health statistics 2004*. World Health Organization.
- World Health Organization. (2010). *World health statistics 2010*. World Health Organization.
- Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment*, 52(1), 30-41.
- Zolnierek, K. B. H., & DiMatteo, M. R. (2009). Physician communication and patient adherence to treatment: a meta-analysis. *Medical Care*, 47(8), 826.

## **APPENDICES**

### **APPENDIX I**



**UNIVERSITY OF GHANA**  
**ETHICS COMMITTEE FOR THE HUMANITIES (ECH)**

*P. O. Box LG 571, Legon, Accra, Ghana*

1<sup>st</sup> March, 2019

My Ref. No.....

Mr. Morrison Fosu  
Department of Psychology  
University of Ghana  
P.O. Box LG84  
Legon

Dear Mr. Fosu,

**ECH 042/18-19: PREDICTORS OF MEDICATION ADHERENCE: A STUDY AMONG PLWHIV IN THE ASHANTI REGION**

This is to advise you that the above reference study has been presented to the Ethics Committee for the Humanities for a full board review and the following actions taken subject to the conditions and explanation provided below:

Expiry Date: 01/09/19  
On Agenda for: Initial Submission  
Date of Submission: 19/11/18  
ECH Action: Approved  
Reporting: Quarterly

Please accept my congratulations.

Yours Sincerely,

Prof. C. Charles Mate-Kole  
ECH Vice Chair

Cc: Dr. Joana Salifu Yendork, Department of Psychology, UG  
Dr. Enoch Teye-Kwadjo, Department of Psychology, UG



APPENDIX II

CONSENT FORMS

UNIVERSITY OF GHANA



Official Use only  
Protocol number

**Ethics Committee for Humanities (ECH)**

**PROTOCOL CONSENT FORM**

**Section A- BACKGROUND INFORMATION**

Title of Study:	Predictors of medication adherence: A study among People Living With HIV (PLWHIV) in the Ashanti Region.
Principal Investigator:	Morrison Fosu
Certified Protocol Number	

**Section B-CONSENT TO PARTICIPATE IN RESEARCH**

**General Information about Research**

This study aims at investigating Predictors of medication adherence among People Living With HIV (PLWHIV). The study will look at how HIV related stigma, Spirituality, Self-efficacy, Doctor patient communication, Social Support of a patient predict how they are likely to adhere to the HIV medication.

The study will require that you complete one full questionnaire, which has two sections. The first section measures demographic information and the second will measure the psychological variables including HIV related stigma, Spirituality, Self-efficacy, Doctor patient communication and Social support and your adherence to the Antiretroviral medications. In total, it will require about fifteen (15) minutes to complete the questionnaires. In a situation whereby you cannot read, the researcher will be available to translate them to your local dialect in order to facilitate the process.

### **Benefits/Risk of the study**

There is no risk associated with this study. As such, all that is required of you is your availability and patience for your responses.

Even though this research was not designed to benefit you directly, participation would ensure that factors that hinder or promote medication adherence are brought into the lime light to influence policies in those direction.

### **Confidentiality**

In order to ensure anonymity and confidentiality, you are not supposed to write your names, contact number, email or mark the questionnaires that might reveal your identity. Information shared by you would be treated as confidential and thus, information would not be released or shared to a third party without the authorization of you. You are assured that the ultimate purpose of this study is for academic purpose.

### **Compensation**

Due to the academic nature of this research presently, no extrinsic rewards would be given.

### **Withdrawal from Study**

You are not obliged by the Ghana Health Service to partake in this study. As a result, there would be no retribution in situations whereby you decide not to participate or withdraw from the study. If you begin to participate in the research, you may at any time, for any reason, discontinue your participation without any negative consequences.

### **Contact for Additional Information**

You can contact the following for any answers to any questions about the research.

Morrison Fosu. Post Office Box 4386, Adum-Kumasi. Contact: +233(0)244274593.

Also, if you have any questions about your rights as a research participant in this study you may contact the Administrator of the Ethics Committee for Humanities, ISSER, University of Ghana at [ech@isser.edu.gh](mailto:ech@isser.edu.gh) / [ech@ug.edu.gh](mailto:ech@ug.edu.gh) or 00233- 303-933-866.

Section C-VOLUNTEER AGREEMENT

**"I have read or have had someone read all of the above, asked questions, received answers regarding participation in this study, and am willing to give consent for me, my child/ward to participate in this study. I will not have waived any of my rights by signing this consent form. Upon signing this consent form, I will receive a copy for my personal records."**

\_\_\_\_\_  
Name of Volunteer

\_\_\_\_\_  
Signature or mark of volunteer

\_\_\_\_\_  
Date

**If volunteers cannot read the form themselves, a witness must sign here:**

I was present while the benefits, risks and procedures were read to the volunteer. All questions were answered and the volunteer has agreed to take part in the research.

\_\_\_\_\_  
Name of witness

\_\_\_\_\_  
Signature of witness

\_\_\_\_\_  
Date

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the above individual.

Name of Person who Obtained Consent

\_\_\_\_\_  
Signature of Person Who Obtained Consent

\_\_\_\_\_  
Date

APPENDIX III

**UNIVERSITY OF GHANA – LEGON**

**DEPARTMENT OF PSYCHOLOGY**

[email@ug.edu.gh](mailto:email@ug.edu.gh)

**PREDICTORS OF MEDICATION ADHERENCE: A STUDY AMONG PLWHIV IN  
THE ASHANTI REGION OF GHANA**

Morrison Fosu

Supervisors: Joana Salifu Yendork (PhD)

Enoch Teye-Kwadwo (PhD)

**INFORMED CONSENT STATEMENT**

**1. Invitation to Participate and Description of the Project:** You are being invited to willingly participate in the study on the predictors of medication adherence among PLWHIV. The outcome of this study will enable us have a better understanding of some of the factors that predict medication adherence among patients with immunosuppression so that appropriate recommendations can be made to stakeholders and policy makers. Your participation in the research is entirely voluntary. Before agreeing to be part of this study, please read or listen carefully to the information and feel free to ask questions if you do not understand something.

**2. Description of Procedure:** If you participate in this study, you will be asked to:

- a. give a brief selected information about your age, sex, religion, level of education, Comorbid conditions if any.
- b. This study consists of asking several questions about HIV related stigma, your perceived social support, self-efficacy, how you rate doctor communication skills and your spirituality.
- c. The entire research pertaining to your involvement will last for about 15 minutes.

**3. Risks and Inconveniences:** be assured that this research does not contain any procedures that would cause pain or discomfort to you, however, you may experience some tiredness. As a result, be willing to let me know if you are tired so that we take some short break or continue at a later time.

**4. Benefits:** Participation would ensure that factors that predict medication adherence among PLWHIV are brought to light to stimulate stakeholders to put together interventions that will promote the factors that enhance adherence to your medication in order to help you live longer and healthy.

**5. Confidentiality:** In order to ensure anonymity and confidentiality, you are not supposed to write your names, contact number, email or mark the questionnaires that might reveal your identity. Information shared by you would be termed as confidential and thus, information would not be released or shared to a third party without the authorization of you. Assurance would be given that the ultimate purpose of this study is for academic purpose.

**6. Voluntary Participation:** Your participation in this research is entirely voluntary; due to that, you may refuse to participate in this research even without explanation. You are not obliged by the Ghana Health Service to partake in this study. As a result, there would be no retribution in situations whereby you decide not to participate or withdraw from the study. If you begin to participate in this research, you may at any time, for no reason, discontinue your participation without any negative consequences.

**7. Other Considerations and Questions:** Kindly read through the consent form carefully before you sign and please feel free to ask any questions about anything that seems unclear to you.

**8. Authorization:** I have read or listened to the above information and I have decided that I will participate in the project described above. The researcher has explained the study to me and answered my questions. As a matter of fact, I know what will be asked of me and I also understand that the purpose of the study is to investigate predictors of medication adherence among PLWHIV. If I don't participate in the research, there will be no penalty or loss of rights, and that I can stop participating at any time even when I have started.

By signing, I agree to participate in this research and to have a copy of the consent form

Participant's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

If you have further questions about this research project and about your rights as a research participant, please contact the Department of psychology – Legon or [morrisonfosu@gmail.com](mailto:morrisonfosu@gmail.com) (the researcher).



APPENDIX V

**DEMOGRAPHIC INFORMATION**

*Please answer the following by filling in the blank space*

1. Age .....

**2. Comorbid condition**

None  Hypertension only  Hypertension and Diabetics  Diabetes only   
 Psychiatric Illness  Other  please specify.....

**3. Highest Education:** Nil  Primary  JHS/MSLC  SHS  Tertiary

**4. HIV stage when diagnosed:** One  Two  Three  Four

**5. Religion:** Christian  Muslim  Traditional  Other

**6. Sex** Male  Female

**SECTION B**

HIV related stigma

**Please indicate your level of agreement to the following statements by circling the appropriate number that corresponds with the answer key.**

N o.	Item	STRONGLY DISAGREE (1)	DISAGREE(2)	AGREE(3)	STRONGLY AGREE (4)
1.	People I care about stopped calling after learning I have HIV	1	2	3	4
2.	I have lost friends by telling them I have HIV	1	2	3	4
3.	Some people avoid touching me once they know I have HIV	1	2	3	4
4.	I work hard to keep my HIV a secret	1	2	3	4
5.	Telling people I have HIV is risky	1	2	3	4
6.	I am very careful who I tell I have HIV	1	2	3	4
7.	Most people believe a person who has HIV is promiscuous	1	2	3	4
8.	People with HIV are treated like outcasts	1	2	3	4
9.	Most people are uncomfortable around someone with HIV	1	2	3	4

10	I feel guilty because I have HIV	1	2	3	4
11	People's attitude about HIV makes me feel worse about myself	1	2	3	4
12	I feel I'm not as good a person as others because I have HIV	1	2	3	4

General self efficacy

**Please indicate your level of agreement to the following statements by circling the appropriate number that corresponds with the answer key.**

No.	Items	Not at all true (1)	Hardly true (2)	Moderately true (3)	Exactly true (4)
1.	I can always manage to solve difficult problems if I try hard enough	1	2	3	4
2.	If someone opposes me, I can find the means and ways to get what I want	1	2	3	4
3.	It is easy for me to stick to my aims and accomplish my goals	1	2	3	4
4.	I am confident that I could deal efficiently with unexpected events	1	2	3	4
5.	Thanks to my resourcefulness, I know how to handle unforeseen situations.	1	2	3	4
6.	I can solve most problems if I invest the necessary effort	1	2	3	4
7.	I can remain calm when facing difficulties because I can rely on my coping abilities	1	2	3	4

8.	When I am confronted with a problem, I can usually find several solutions.	1	2	3	4
9.	If I am in trouble, I can usually think of a solution	1	2	3	4
10.	I can usually handle whatever comes my way.	1	2	3	4

Perceived Social Support

**Please indicate your level of agreement to the following statements by circling the appropriate number that corresponds with the answer key.**

**1. Very Strongly Disagree      4. Neutral      7. Very Strongly Agree**

**2. Strongly Disagree      5. Mildly Agree**

**3. Mildly Disagree      6. Strongly Agree**

No.	Item	1	2	3	4	5	6	7
1.	There is a special person who is around when I am in need	1	2	3	4	5	6	7
2.	There is a special person with whom I can share joys and sorrows.	1	2	3	4	5	6	7
3.	My family really tries to help me	1	2	3	4	5	6	7
4.	I get the emotional help & support I need from my family	1	2	3	4	5	6	7
5.	I have a special person who is a real source of comfort to me.	1	2	3	4	5	6	7
6.	My friends really try to help me.	1	2	3	4	5	6	7
7.	I can count on my friends when things go wrong.	1	2	3	4	5	6	7
8.	I can talk about my problems with my family.	1	2	3	4	5	6	7
9.	I have friends with whom I can share my joys and sorrows	1	2	3	4	5	6	7
10.	There is a special person in my life who cares about my feelings.	1	2	3	4	5	6	7
11.	My family is willing to help me make decisions.	1	2	3	4	5	6	7

12.	I can talk about my problems with my friends.	1	2	3	4	5	6	7
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**Spirituality scale**

**Please indicate your level of agreement to the following statements by circling the appropriate number that corresponds with the answer key.**

**Key:**

- 1. Strongly Disagree**
- 2. Disagree**
- 3. Mostly disagree**
- 4. Mostly agree**
- 5. Agree**
- 6. Strongly Agree**

1. I find meaning in my life experiences.	1	2	3	4	5	6
2. I have a sense of purpose.	1	2	3	4	5	6
3. I am happy about the person I have become.	1	2	3	4	5	6
4. I see the sacredness in everyday life.	1	2	3	4	5	6
5. I meditate to gain access to my inner spirit	1	2	3	4	5	6
6. I live in harmony with nature.	1	2	3	4	5	6
7. I believe there is a connection between all things that I cannot see but can sense.	1	2	3	4	5	6
8. My life is a process of becoming.	1	2	3	4	5	6
9. I believe in a Higher Power/Universal Intelligence.	1	2	3	4	5	6
10. I believe that all living creatures deserve respect.	1	2	3	4	5	6
11. The earth is sacred.	1	2	3	4	5	6
12. I value maintaining and nurturing my relationships with others.	1	2	3	4	5	6
13. I use silence to get in touch with myself.	1	2	3	4	5	6
14. I believe that nature should be respected.	1	2	3	4	5	6
15. I have a relationship with a Higher Power/Universal Intelligence.	1	2	3	4	5	6
16. My spirituality gives me inner strength.	1	2	3	4	5	6
17. I am able to receive love from others.	1	2	3	4	5	6
18. My faith in a Higher Power/Universal Intelligence helps me cope during challenges in my life.	1	2	3	4	5	6

## Communication Assessment Tool

Please indicate your level of agreement to the following statements by circling the appropriate number that corresponds with the answer key

- 1- Poor
- 2- Fair
- 3- Good
- 4- Very good
- 5- Excellent

No.	Items	1	2	3	4	5
1.	Talked in terms I could understand.	1	2	3	4	5
2.	How would you rate the care provided by your doctoran	1	2	3	4	5
3.	Paid attention to me (looked at me, listened carefully).	1	2	3	4	5
4.	Treated me with respect.	1	2	3	4	5
5.	Greeted me in a way that made me feel comfortable.	1	2	3	4	5
6.	Showed care and concern.	1	2	3	4	5
7.	Understood my main health concerns.	1	2	3	4	5
8.	Discussed next step including any follow-up plans.	1	2	3	4	5
9.	Gave me as much information as I wanted.	1	2	3	4	5
10.	Let me talk without interruptions.	1	2	3	4	5
11.	Showed interest in my ideas about my health.	1	2	3	4	5
12.	Spent the right amount of time with me.	1	2	3	4	5
13.	Checked to be sure I understood everything.	1	2	3	4	5
14.	Involved me in decisions as much as I wanted.	1	2	3	4	5
15.	Encouraged me to ask questions.	1	2	3	4	5

**Please indicate your level of agreement to the following statements by circling the appropriate number that corresponds with the answer key**

1 =Very untrue of me

2=Untrue of me

3=Neutral

4=True of me

5=Very true of me

No.	Item					
1.	I sometimes forget to take my HIV medicine.	1	2	3	4	5
2.	I have problems remembering to take my HIV medication.	1	2	3	4	5
3.	When I feel better, I sometimes stop taking my HIV medicine.	1	2	3	4	5
4.	Sometimes if I feel worse when I take my HIV medicine, I stop taking it.	1	2	3	4	5