

**FACTORS INFLUENCING ANTIRETROVIRAL THERAPY ADHERENCE IN ADULT
HIV POSITIVE PATIENTS ATTENDING KENDU SUB COUNTY HOSPITAL, KENYA**

BY

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DECLARATION

I, **Wycliffe Ondiek Dunde** do hereby declare that this thesis is my original work and has not been submitted for the award of a degree or diploma in any other University or college.

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DEDICATION

I dedicate this thesis report to my beloved wife Elector Adhiambo Dunde and daughter Petunia Imani whose input and encouragement kept me going and contributed to the success of this work.

ABSTRACT

Adherence to ART is a patient's ability take the prescribed medication and advises accordingly. Factors influencing adherence vary across different settings. Sustaining adherence presents a significant challenge at Kendu sub county hospital as evidenced by the defaulters' rate (3 in 10) and high viral load (5 in 10) patients on ART treatment. This study determined factors influencing ART adherence in adult patients on care at Kendu sub-county hospital. The study determined the influence of patient, medication and patient-health provider relationship factors on ART adherence among the patients. Using a cross sectional study, a sample of 316 patients aged ≥ 18 years were systemically selected from a population of 1013 HIV patients on care. Self administered questionnaires were used to collect data on patient, clinical and patient-provider relationship factors. Secondary data on eligible respondents was obtained from hospital records. Data on demographic features was descriptively analyzed. Binary logistic regression analyzed influence of study factors on ART adherence. Patient factors [distance (CI= -.1080, -.049; OR= -.078; $P = .000$), stigma and denial (CI= -.160, -.089; OR= -.124; $P= .000$) and literacy level (CI=-.202, -.081; OR= -.141; $p= .000$)] were statistically significant at $P < 0.05$. Medication factors [side effects (CI= -.207, -.072; OR= -.139; $P= .000$), adverse drug reactions (CI= .185, .294; OR= .239; $P= .000$), dose complexity (CI= -.197, -.153; OR= -.175; $P= .000$) and pill burden (CI= -.166, -.043; OR= -.104; $P = .001$)] were statistically significant at $P < 0.05$. Patient-provider factors [effective communication (CI= -.132, -.074; OR= -.103; $p= .000$), health provider's personality and attitude (CI= -.255, -.178; OR= -.216; $P= .000$), professionalism (CI= -.188, -.122; OR= -.155; $P= .000$), and timeliness (CI= -.406, -.270; OR= -.338; $P= .000$)] were statistically significant at $P < 0.05$. Factors that influence adherence should be exploited further to improve patients' adherence. These findings will inform strategies on improving adherence in the effort towards health management in HIV positive patients.

TABLE OF CONTENT

TITLE PAGE.....	i
DECLARATION	ii
ACKNOWLEDGEMENT	iii
DEDICATION.....	iv
ABSTRACT.....	v
TABLE OF CONTENTS.....	vi
LIST OF ABBREVIATIONS.....	viii
DEFINITION OF TERMS	ix
LIST OF TABLES.....	x
LIST OF FIGURES	xi
LIST OF APPENDICES.....	xii
CHAPTER ONE: INTRODUCTION.....	1
1.1 Background Information of the Study	1
1.2 Statement of the Problem.....	5
1.3 Justification of the Study	5
1.4 Significance of the Study	5
1.5 General Objective	6
1.6 Specific Objectives	6
1.7 Research Questions.....	6
CHAPTER TWO: LITERATURE REVIEW	7
2.1 Adherence to Antiretroviral Therapy.....	7
2.2 Patient Factors and Adherence to Antiretroviral Therapy	9
2.3 Medication Factors and Adherence to Antiretroviral Therapy.....	10
2.4 Patient- Health Provider Relationship and Adherence to Antiretroviral Therapy	12
2.5 Conceptual Framework on Factors Affecting Adherence to ART among People Living with HIV and AIDS at Kendu Sub County Hospital	15

CHAPTER THREE: METHODOLOGY	16
3.1 Study Site	16
3.2 Study Population.....	18
3.3 Research Design.....	19
3.4 Sample Size Determination.....	19
3.5 Inclusion Criteria	19
3.6 Sampling Technique	20
3.7 Data Collection	20
3.8 Data Analysis and Presentation Techniques	20
3.9 Ethical Consideration.....	21
3.10 Study Limitations and Potential Biases	21
3.11 Measurement of Variables	22
CHAPTER FOUR: RESULTS	23
4.1 Response Rate.....	23
4.2 Socio-Demographic Characteristics of the Study Participants	24
4.3 Patient Factors Influencing Adherence to Antiretroviral Therapy	25
4.4 Medication Factors Influencing Adherence to Antiretroviral Therapy	26
4.5 Patient-Health Provider Relationship Factors Influencing Adherence to Antiretroviral Therapy	27
CHAPTER FIVE: DISCUSSION.....	28
5.1 Patient Factors Influencing Adherence to Antiretroviral Therapy	28
5.2 Medication Factors Influencing Adherence to Antiretroviral Therapy	29
5.3 Patient-Health Provider Factors Influencing Adherence to Antiretroviral Therapy.....	30
CHAPTER SIX:SUMMARY, CONCLUSION AND RECOMMENDATION	32
6.1 Summary.....	32
6.2 Conclusions.....	32
6.3 Recommendations.....	32
6.4 Areas for Further Studies	33
REFERENCES.....	34
APPENDICES.....	51

LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency syndrome
ART	Antiretroviral Therapy
ARV	Antiretroviral
HAART	Highly active antiretroviral therapy
HIV	Human Immunodeficiency Virus
OI	Opportunistic infections
PLWHIV	People living with Human Immunodeficiency Virus

DEFINITION OF TERMS

Adherence (medication) : Adherence means “to stick firmly.” So for people with HIV, adherence means sticking firmly to an HIV regimen—taking HIV medicines every day and exactly as prescribed.

Adverse drug reactions: An adverse drug reaction (ADR) is an injury caused by taking medication.

Compliance (medication): In medicine, compliance (also adherence, capacitance) describes the degree to which a patient correctly follows medical advice.

Concordance : The process by which a patient and clinician make decisions together about treatment plan.

Incidence rate : The number of new cases per population at risk in a given time period.

Prevalence rate : The number of people in a population who have a disease at a given time.

Treatment failure : When an antiretroviral (ARV) regimen is unable to control HIV infection. Treatment failure can be clinical failure, immunologic failure, virologic failure or any combination of the three.

LIST OF TABLES

Table 4.1: Socio-Demographic Characteristics of Study Participants.....	24
Table 4.2: Regression Results on Influence of Patient Factors on Adherence to ART.....	25
Table 4.3: Medication Factors Influencing Adherence to ART.....	26
Table 4.4: Influence of Patient Provider Factors on Adherence to ART.....	26

LIST OF FIGURES

Figure 1: Self-Conceptualized Framework.....	15
Figure 2: Kenyan Map showing the location of Homa Bay County and its eight sub counties...17	
Figure 3: Rachuonyo North Map Sub County.....	19

LIST OF APPENDICES

Appendix I: Questionnaire.....	51
Appendix II: Informed Consent Form.....	55
Appendix III: Ethical Review Committee Clearance.....	56
Appendix IV: Budget.....	57

CHAPTER ONE

INTRODUCTION

This chapter presents an overview of the concept of factors influencing antiretroviral therapy adherence in adult HIV positive patients attending Kendu sub county hospital, Rachuonyo North Sub County, Homa Bay County, Kenya. The chapter also presents the research problem, the objectives of the study, research questions and study justification.

1.1 Background Information of the Study

Globally, about 36.7 million people were living with HIV by 2016 of which 34.5 million were adults (UNAIDS, 2017). This included 17.8 women (15+ years and 2.1 million children (<15 years). There were 19.4 million people living with HIV in eastern and southern Africa (UNAIDS 2017). Women and girls account for more than half (59%) of the total number of people living with HIV in eastern and southern Africa. Eastern and southern Africa accounts for 43% of the global total of new HIV infections. There were an estimated 790 000 new HIV infections in eastern and southern Africa. In Kenya prevalence of HIV stands at 1.6 million of which 5.4% are adults, 62000 new infections, 36000 AIDS related deaths, 64% adults and 65% children among the infected were on treatment (UNAIDS, 2017).

HIV prevalence in Homa Bay county stands at 26% (Egger *et al.*, 2002, NASCOP, 2016). Homa Bay County was one of the nine high HIV incidence counties in Kenya in 2014 with a total of 16,597 new infections. Out of the 16,597 newly infected people, 27.4% were children aged 0-14 years (13.04%), and young people aged 15-24 years (14.36%). The proportion of HIV positive pregnant women receiving ARVs for PMTCT in 2014 was 62%, leaving out the remaining 38% of HIV positive pregnant women who gave birth to the 2,164 HIV positive children in the same year (NACC/NASCOP, 2015).

Adherence to medication is a patient's ability to follow a treatment plan by taking medication at prescribed times and frequencies, and follow restrictions regarding food and other medications (Sahay *et al.*, 2011). Adherence is a global problem in any chronic disease and an average non-adherence rate of 24.8% have been reported (DiMatteo, 2004). Non-adherence can have significant effects on chronic disease treatment outcomes as well as lead to failure of primary regimen as in the case of HIV management. (Sokol *et al.*, 2005 and Wroth & Pathman, 2006;). To achieve optimal results from ART, high patient adherence to ART (95% and above) is essential (Paterson *et al.*, 2000 and Nelson *et al.*, 2010,). An adherence below 95% is classified as non-adherence. Adherence failure is a risk factor for development of drug resistance (Machado *et al.*, 2011 and Chen *et al.*, 2016,). Based on hospital records, adherence at Kendu Sub county hospital is between 75% to 85% indicating poor adherence to ART.

Factors that influence adherence include; patient factors, medication factors and patient-provider relationship factors. Patient factors that were found to influence adherence included psychosocial barriers like depression and other mental illnesses, neurocognitive impairment, low literacy level, low level of social support, busy schedule and stressful lifestyle and/or events, high levels of alcohol consumption and active substance use, homelessness, poverty, nondisclosure of HIV serostatus, denial, stigma, and inconsistent access to medications (Carr & Gramling, 2004, Halkitis *et al.*, 2005 and Stirratt *et al.*, 2006,). Patient factors influencing adherence vary across different settings. For instance, knowledge was linked to non-adherence in Israel (Najjar *et al.*, 2015). In Malawi, lack of emotional and financial support from husband or wife, inadequate counseling and internal migration were the reported reasons for non-adherence to ART (Gugsa *et al.*, 2017). Younger age, rural residence and substance use were important factors influencing adherence to ART in Kenya (Mukui *et al.*, 2016). In Kendu sub county hospital setting, hospital

records show that there is a problem of adherence to ART among people living with HIV but factors influencing this are not clear.

Clinical or Medication-related factors that affect adherence include comorbid conditions like tuberculosis and other chronic illnesses (Buck *et al.*, 1997; Chan *et al.*, 2016), adverse reactions; the complexity of dosing regimens; the pill burden; and dietary restrictions. Characteristics of one or more components of the prescribed regimen can affect adherence. Simple, once-daily regimens (Parianti *et al.*, 2009), including those with low pill burden, without a food requirement, and few side effects or toxicities, are associated with higher levels of adherence (Raboud *et al.*, 2011). As well clinical factors influencing adherence to ART vary too across region and clinical setting. For instance, a study conducted in Romania found that ART side effects and adverse drug reactions were among the main barriers to ART adherence (Dima *et al.*, 2013). In contrast, treatment regimen-related factors affecting adherence according to a study done in a clinical trial in United States of America found that pill burden and comorbid conditions to be the main factors affecting adherence to ART (Chesney, 2000). There lacks clear information showing the clinical factors influencing adherence to ART in both Kendu sub county hospital and Homa Bay county.

Adherence requires collaboration between the patient and health care provider in addition to sticking to medications and other health services (Laufs *et al.*, 2011). Patient-provider factors like clear and effective communication, professionalism, timeliness and good attitude are important in improving adherence. Patient-provider relationship that enhances patient trust through non-judgmental and supportive care and use of motivational strategies can positively influence medication adherence. Central to adherence is the quality of the patient-health care provider relationship (Cooper *et al.*, 2009 and Haskard & DiMatteo, 2009). Effective patient-

health care provider communication and short waiting time are empirically linked to positive outcomes of care including patient satisfaction, health status, recall of information, and adherence (Balkrishnan *et al.*, 2003, Moore *et al.*, 2004, Cooper *et al.*, 2009 and Haskard & DiMatteo, 2009). Provider-patient discussions help patients understand their illness and weigh the risks and benefits of treatment (Haskard & DiMatteo, 2009 and Cooper *et al.*, 2009). According to studies by Spikmans *et al.*, (2003); Gascon *et al.*, (2004) and Lawson *et al.*, (2005) unhappy or unsatisfied clinic visits contributed to poor compliance. Though patient- provider relationship has been cited severally in this study to influence adherence to medications, less is known on patient-provider factors influencing adherence at Kendu sub county hospital bearing in mind that variation exists among different regions and settings.

In this study, factors influencing adherence were classified as patient related factors (distance, disclosure, nondisclosure, poverty, stigma and denial, social support, daily schedule, lifestyle, literacy level and vision impairment), Medication related factors (side effect adverse drug reactions, dose complexity, comorbid conditions and pill count) and patient-provider factors (effective communication, provider personality, professionalism and timely service delivery). It is worth noting that these factors vary across regions, clinical settings and socio-demographic characteristics. Kendu Sub County hospital is located in a rural setting where the main economic activities include fishing and farming. It is not clear which factors among the cited in this study influence adherence to ART. Based on Kendu sub county hospital's records/ registers, patients' receiving health services from the hospital adhere poorly to ART. Patients' records/register for the month of March 2016, revealed non-adherence to clinic attendance (3 out of 10 patients) with about 5 in 100 of the patients on care reported high viral loads.

1.2 Statement of the Problem

Factors that influence adherence level to ART are known but there exists a variance across regions, socio-demographic characteristics and clinical settings. There is lack of clarity on the main factors influencing adherence among PLWHIV at Kendu Sub county hospital. Sustaining adherence presents a significant challenge for people receiving ART treatment at Kendu Sub County hospital. This has been evidenced by the increasing number of patients defaulting on clinic attendance, reporting inconsistent pill taking and high viral load of more than 1000 copies based on data obtained from hospital records. As evidenced by Kendu sub county hospital's patient support clinic HIV and AIDS patients' registers, about 5 in 100 of the patients on care reported high viral loads and 3 out of 10 missed their clinic appointments without clear reasons as of September 2016. Improved adherence is important in enhancing quality and longevity of life. The statistics indicate that many patients face the danger of being overpowered by the syndrome thus lowering their quality of life as well as shortening their lifespan.

1.3 Justification of the Study

This study was important based on the fact that non adherence to antiretroviral medication leads to drug resistance, treatment failure, increased burden on health care system and economic stagnation of the community and country. Addressing issues that could improve adherence was important in improving these indicators.

1.4 Significance of the Study

The results from the study highlighted factors that influenced adherence to ART. On patient related factors; distance, stigma and denial and literacy were found to influence antiretroviral adherence. On medication factors; side effects, adverse drug reaction, dose complexity and pill burden were found to influence antiretroviral therapy adherence. On patient-health provider

relationship factors; effective communication, health provider's personality and attitude, professionalism, and timeliness in service provision were found to influence antiretroviral therapy adherence. These study findings were important in informing strategy on improving adherence to antiretroviral therapy both at Kendu sub county hospital.

1.5 General Objective

To assess factors influencing antiretroviral therapy adherence in adult HIV positive patients attending Kendu sub county hospital, Kenya.

1.6 Specific Objectives

- 1.6.1. To determine the influence of patient factors on antiretroviral therapy adherence among people living with HIV and AIDS.
- 1.6.2. To determine the medication factors influencing antiretroviral therapy adherence among people living with HIV and AIDS.
- 1.6.3. To determine the influence of patient-health provider relationship on the antiretroviral therapy adherence among people living with HIV and AIDS.

1.7 Research Questions

- 1.7.1. What patient factors influence antiretroviral therapy adherence among people living with HIV and AIDS?
- 1.7.2. What medication factors influence antiretroviral therapy adherence among people living with HIV and AIDS?
- 1.7.3. How does patient-health provider relationship influence antiretroviral therapy adherence?

CHAPTER TWO

LITERATURE REVIEW

This chapter reviews the empirical and theoretical literature on the key study variables. This review is intended to identify the research gap. The literature review more precisely examines the existing literature on adherence to ART and how they have contributed to the well being of patients with HIV and AIDS.

2.1 Adherence to Antiretroviral Therapy

Adherence with medication usage is defined as the proportion of prescribed doses of medication actually taken by a patient over a specified period of time (Blower, 2003). The term “adherence”, implies an active role in collaboration with a prescriber, and “non-adherence” encompasses the diverse reasons for patients not following a treatment recommendation (Pinter, 2002). According to the World Health Organization (WHO), non-adherence to the medical regimen consist a major clinical problem in the management of patients with chronic illness (WHO, 2003). Antiretroviral therapy (ART) is a proven treatment for HIV and ADS patients in improving the health status and quality of life of HIV and AIDS patients by reducing the rate of disease progression (Joint United Nations Programme on HIV and AIDS, 2011). Appropriate treatment is important in obtaining full benefits of ART: durable suppression of viral replication, reduced destruction of CD4 cells, prevention of viral resistance, promotion of immune reconstitution, and slowed disease progression (Stricker *et al.*, 2014). Based on hospital records at Kendu sub county hospital records, about 3 out of 10 patients defaulted on clinic attendance thus not able to access ART services that include counseling and drugs administration.

Poor ART adherence is a notable public health problem in developing countries (Asmare *et al.*, 2014). An individual is considered as non-adherence for ART if he/she had a history of taking

doses 2 or more hours before, and/or 2 or more hours after the time of a doctor's advice to take doses or missing doses completely (i.e., <95% adherence = missing >2 doses of 30 doses or >3 doses of 60 doses) (Sama and Kellerman, 2010 and Asmare *et al.*, 2014). Missing four pills or doses would result in 93% adherence and missing five pills would result in 91% adherence (Paterson *et al.*, 2000). Several studies have shown varying levels of adherence: more than 10% of patients report missing one or more medication doses on any given day, and more than 33% report missing doses in the past two to four weeks (Chesney, 2006). In the United States of America, Centers for Disease Control and Prevention (CDC) estimates that only approximately 40% of persons with diagnosed HIV are virally suppressed because of poor linkage to care and retention in care (CDC, 2018). Apart from non-adherence to clinic attendance, patients (about 5 in 100 of the patients) receiving ART services at Kendu sub county hospital have reported high viral load of more than 1000 copies which is one of the indication of poor adherence.

Achieving the WHO 2020 treatment goals (By 2020, 90% of all people living with HIV to know their HIV status, 90% of all people with diagnosed HIV infection to receive sustained antiretroviral therapy, and 90% of all people receiving antiretroviral therapy to have viral suppression by 2020) and the goal of ending the AIDS epidemic as a public health threat by 2030 (WHO, 2016), will depend on the success of current HIV treatment programs. Such success will not only depend on access to HIV treatment, but also on good adherence to ART and retention on care, which is necessary to achieve viral suppression, to prevent viral failure, diminish viral transmission, and reduce HIV and AIDS-related deaths (Fonsah *et al.*, 2017). Studies of HIV positive subjects on ART in Cameroon showed high rates of non-adherence, treatment interruption, and loss to follow-up and this was associated with drug resistance and virologic failure (Meresse *et al.*, 2014). However, according to Fonsah *et al.*, (2017), the factors

that hindered adherence to ART in Cameroon were not well known and for ART treatment programs in Cameroon to be successful, it was critical to identify barriers to adherence, then determine and implement appropriate measures to promote and improve adherence. In their study, Fonsah *et al.*, (2017) used both patient self-reported questionnaires and pharmacy medication refill data to quantify adherence to ART, and to determine the factors associated with increased risk of non adherence. At Kendu sub county hospital setting, the high number of patients reporting viral loads of more than 1000 copies are at risk of developing drug resistant strains of the virus or being transited to second line regimen that are associated with poor tolerability due to adverse reactions.

2.2 Patient Factors and Adherence to Antiretroviral Therapy

Patient factors that influence adherence to antiretroviral medication are diverse. For instance, in the studies by van *et al.*, (2003) and Ingersoll & Cohen, (2008), it was found that gender, age, ethnicity, fluid and dietary restrictions, vision loss, cognitive impairment and patient confusion influenced adherence to medication. On the other hand, Wasti *et al.*, (2012), in their study, found that distance to the hospital was a barrier to adherence to antiretroviral medications. Stigma and denial were cited as influencing adherence to ART in other studies by Haberer & Mellins, (2009), and Stutterheim *et al.*, (2012). Acceptance of HIV status was found to promote adherence, while denial was found to be negatively related to treatment adherence in studies by Nam *et al.*, (2008) and Hosseini *et al.*, (2016). However, it was not clear whether the same factors like distance to the hospital, stigma and denial, vision loss and disclosure influenced adherence to ART in Kendu sub county hospital setting.

Food shortage due to poverty, use of traditional medicine, alcohol abuse, depression, stigma and discrimination, lack of social support, homelessness, stressful life events and psychosis were also

cited as affecting individual patient's ability to adhere to Antiretroviral medications (Amberbir *et al.*, 2008, Leserman *et al.*, 2008, Weiser *et al.*, 2009 and Merten *et al.*, 2010). Additionally, other factors that were associated with poor adherence included Illiteracy or low levels of health literacy or numeracy (ability to understand numerical-related health information) (Marcus, 2006 and Waldrop-Valverde *et al.*, 2009). Nondisclosure of HIV serostatus was linked to poor adherence in studies by Mills *et al.*, (2006) and Stirratt *et al.*, (2006). Additionally, difficulty with taking medication (e.g., trouble swallowing pills, daily schedule issues); duration living with HIV and AIDS (e.g., becoming tired of taking drugs and giving up,); non-adherence to clinic appointments; cost and insurance coverage issues; and treatment fatigue influenced adherence to ART among African Americans in the USA (Mugavero *et al.*, 2009). Other factors cited as affecting adherence were simply forgetting, feeling sick or ill, being busy and running out of medication (Busari *et al.* , 2015). Though poverty, low literacy level, non-disclosure, busy schedules and lifestyle were cited as influencing adherence to ART in other settings, there was no clarity if the same factors were having an influence on ART adherence at Kendu sub county hospital setting.

2.3 Medication Factors and Adherence to Antiretroviral Therapy

Medication factors influencing adherence to ART are diverse. In studies by O'Brien *et al.*, (2003), Gounden *et al.*, (2010) and Abdelhady *et al.*, (2016), adverse drug reactions were cited as among medication related factors influencing a patient adherence to ART. Adverse drug reactions have been and still remain among the most common reasons for switching or discontinuing therapy and for medication non-adherence. Several factors may predispose individuals to adverse effects of ARV medications, such as: concomitant uses of medications with overlapping and additive toxicities, comorbid conditions that increase the risk of or

exacerbate adverse effects (e.g., alcoholism or coinfection with viral hepatitis) have been cited as well. Comorbid conditions in HIV were cited in a number of studies as influencing adherence to ART. Conditions like hypertension, chronic kidney disease were linked to poor adherence among people living with HIV (Bica *et al.*, 2001, Wyatt *et al.*, 2007, Choi *et al.*, 2010, Weiss *et al.*, 2010, Freiberg *et al.*, 2013, Longenecker *et al.*, 2014, Mallipattu *et al.*, 2014, and Weiss *et al.*, 2016). Based on this it is not clear which factors influence adherence to ART at Kendu sub county hospital thus this study focused on the influence of adverse drug reaction and co-morbid conditions on of ART adherence.

Side effects associated with ART were also cited as being barriers to ART adherence. In a study by Liying *et al.*, (2016), it was found that side effects were negatively related to adherence to ART. Wei-Ti *et al.*, (2013) conducted a study on respondents of Chinese origin, and found that although ART side effects could be moderated, they remained a part of the comprehensive illness experience and without careful management they could reinforce existing negative attitudes and ultimately lead to lower ART adherence level. In their study, Phillips *et al.*, (2016) found that of the pregnant mothers on Efavirenz under their study, 97% of women reported experiencing at least one side effect after ART initiation, with 48% experiencing more than five side effects. Gastrointestinal, central nervous system, systemic and skin side effect was reported by 81%, 85%, 79% and 31% of women, respectively, with considerable overlap across groups. At least one missed dose was reported by 32% of women. As well, a study in the USA reported that participants with worrying side-effects tended to be non-adherent to their antidepressant medications (Tamburrino *et al.*, 2011). It was not clear on how side effects patients experienced influenced their adherence to ART within the Kendu sub county hospital setting.

According to a study conducted by Gianotti *et al.*, (2013), adherence to modern HIV treatment was unaffected by dosing frequency or number of daily pills. However, people who were taking larger numbers of pills reported poorer health due to poor adherence. Dose/ regimen complexity was reported to influence adherence to ART (Jacob *et al.*, 2017). Dose complexity in co-infection and comorbidity has been linked to poor adherence, therapeutic failure, and adverse drug reactions (Muir *et al.*, 2001, South *et al.*, 2009). The ARV regimen once established needs to be strictly monitored in terms of effectiveness and relevant side effects. The large number of pills is probably the most common complaint of HIV-patients. A meta-analysis performed by Clay *et al.*, (2015) showed a significantly higher adherence in patients with a once-daily fixed-dose (“single tablet regimen”) compared to any other treatment regimen. Once-daily fixed dose regimens have been proved to be a crucial step to simplify ARV treatment and are currently the easiest method to increase adherence. Another prospective alternative in this direction is given by the promising long-lasting ARV agents that enable an injectable treatment every 1–3 months. These ARV drugs are under evaluation and appear to have no significant side effects (Llibre *et al.*, 2017). There was lack of clarity on the influence of pill burden and dose complexity on ART adherence within Kendu sub county hospital setting.

2.4 Patient- Health Provider Relationship and Adherence to Antiretroviral Therapy

Patient- health provider factors were associated with adherence to ART in a number of studies. Factors like provider ability to communicate effectively, provider’s attitude and personality, provider’s level of professionalism while handling patients and timely service delivery were cited as influencing adherence to not only ART but to other medications as well (Beach *et al.*, 2005). Physician attitude towards the patient and Physician–patient communication about medication were associated with patients’ adherence to medication (Branch 2000, Catz *et al.*,

2000, CDC, 2002, Dybul *et al.*, 2002, Martin *et al.*, 2005 and Herrmann *et al.*, 2008,). O'Malley *et al.*, (2002), Jimmy & Jose, (2011) and Sak *et al.*, (2017), in their studies, also cited clear and effective communication, good attitude and professionalism when handling patients as being important in improving adherence to antiretroviral medication. In their studies, it was shown that physicians who promoted trust in the therapeutic relationship, who had effective communication and who expressed compassion for their patients succeeded in fostering cooperation and patient adherence with a variety of preventive and treatment recommendations. Poor patient- healthcare provider relationship and low quality services, such as lack of confidentiality and privacy were cited as factors that could hamper adherence to ART (Wasti *et al.*, 2012). Additionally, The patient's opinion and perception of the provider's competency; the provider's willingness to include the patient in the decision-making process; the affective tone of the relationship (e.g. warmth, openness, cooperation) imparted a positive attitude towards adherence to medication (Abbo *et al.*, 2008, Munderi *et al.*, 2012). In their studies, Vermeire *et al.*, (2001) and Haskard & DiMatteo, (2009) found that it was important to consider the patient's daily schedule; patient tolerance of pill number, size and frequency of pills; and any issues affecting absorption (e.g., use of acid reducing therapy and food requirements). There was no clarity on the influence of effective communication, health providers' attitude and personality, and level of professionalism on adherence to ART.

In studies by Kunihiro *et al.*, (2010) and McCarthy *et al.*, (2017), timely service delivery and less waiting time in HIV and AIDS clinic was cited as being important in encouraging patients to honor clinic appointments and access to medications. In Their study in a clinical setting in Uganda, Kunihiro *et al.*, (2010) found that crowded HIV treatment facilities with long patient wait times can deterred patients from attending their clinical appointments and picking up their

medications, ultimately disrupting patient care and compromising patient retention and adherence. It was not clear whether the same findings influenced adherence to ART within Kendu sub county hospital clinical setting.

2.5 Conceptual Framework on Factors Affecting Adherence to ART among People Living with HIV and AIDS at Kendu Sub County Hospital

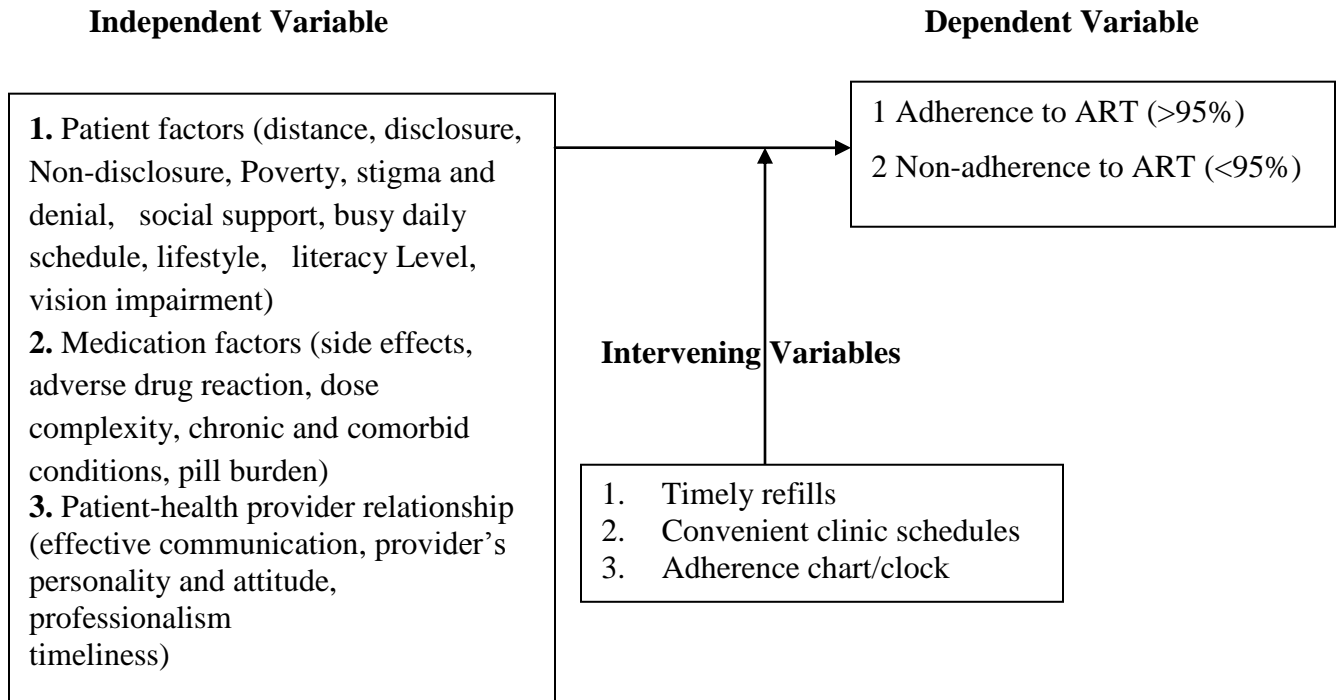


Fig 1: Self-conceptualized framework- Showing the influence of Individual factors, Family factors, Clinical factors and Patient-health provider on adherence to ART (Information obtained from literature review).

Patient factors (distance, disclosure, nondisclosure, poverty, stigma and denial, social support, daily schedule, lifestyle, literacy level and confusion) clinical/medication factors (side effects, adverse drug reactions, dose complexity, comorbid conditions, pill burden), Patient-health provider relationship factors (effective communication, provider personality and attitude, professionalism, timeliness) were cited in a number of studies as influencing adherence to ART. Due to regional, demographic and clinical setting variances, factors influencing adherence in other areas may not be the same as those influencing adherence at Kendu Sub county hospital.

CHAPTER THREE

METHODOLOGY

This chapter presents the research methodology that the research adopted. It presents the research design, the study area, target population, the sample size, sampling techniques, data collection and methods of data analysis.

3.1 Study Site

The study took place at Kendu sub-county hospital. This is the largest public hospital in the Rachuonyo North Sub-county, Homa Bay County. The hospital serves a referral centre for the entire Rachuonyo North sub county with a catchment population of about 193,499 with 100,619 and 92,880 being female and male respectively. Total number identified as HIV positive is 17,235 with 17, 215 being on care. There are a total of 42 Public, community based, faith based and private health facilities in Rachuonyo North Sub County. HIV services are largely offered in public, faith based and community based health facilities. The current HIV and AIDS prevalence stands at 22% and incidence rate at 1.6% (The first Homa Bay county multi-sectoral AIDs strategic plan, 2014/2015-2018/2019). This study site was selected due to the high prevalence and level of treatment failure (about 5 in 100 of the patients) and rate of lost to follow up being experienced (3 in 10 patients). This hospital is based in Kendu Bay town at the junction on Katito-Homa Bay-Oyugis roads. Kendu bay is 346KM from Nairobi in the western part of Kenya in the former Nyanza province. It is at latitude 0° 21' 59.99" N and longitude 34° 38' 59.99" E (<https://latitude.to/articles-by-country/ke/kenya/122383/kendu-bay>).

Location of Homa Bay County on Kenyan MAP

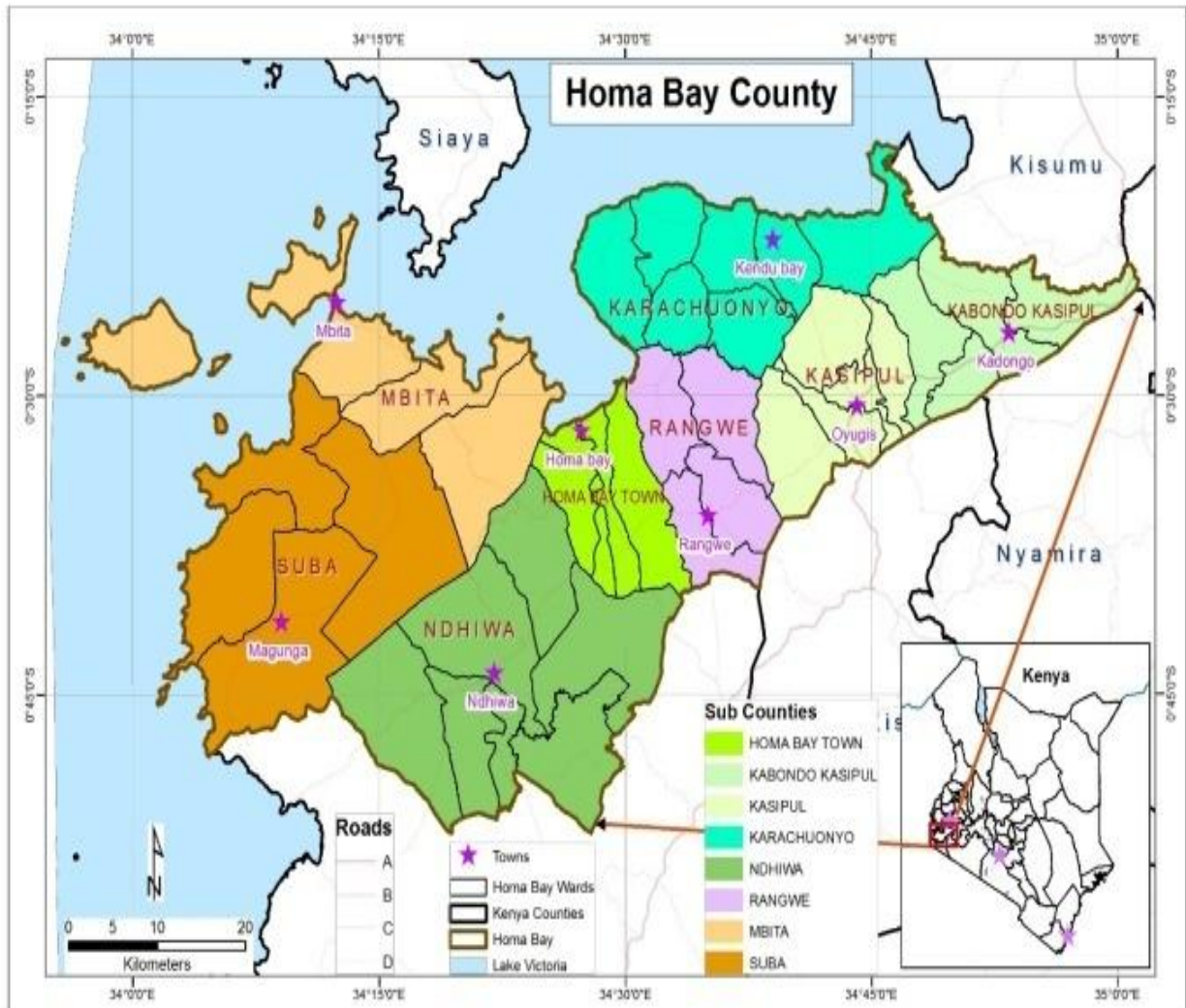


Fig 2. Kenyan Map showing the location of Homa bay county and its eight sub counties of Rachuonyo North (also called Karachuonyo), Suba (now called Suba south), Mbita (Suba North) , Rangwe, Ndhwa, Homa Bay Township, Rachuonyo South (formerly Kasipul) and Rachuonyo east (Formerly Kabondo Kasipul)

Source: https://www.researchgate.net/figure/Map-of-Homa-Bay-County-Source-GoK-2013_fig1_319644498

RACHUONYO NORTH SUB COUNTY

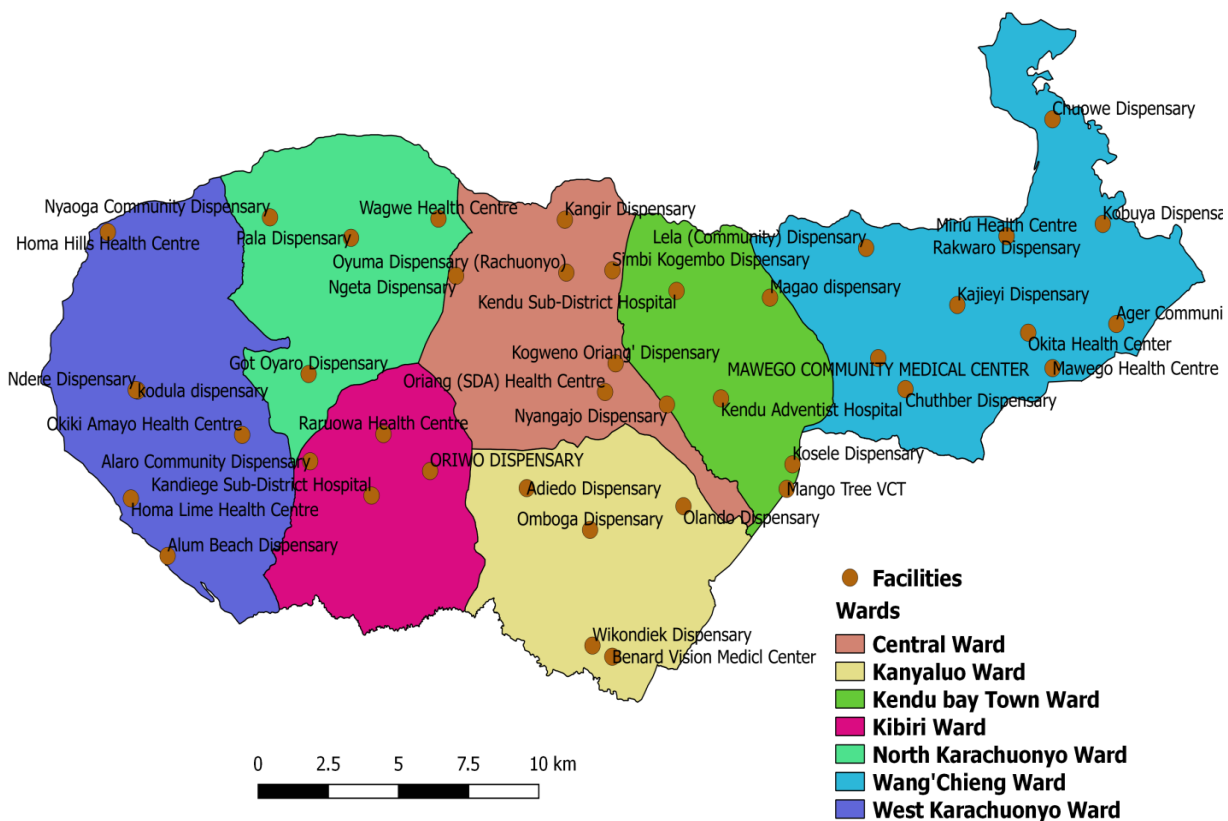


Fig 3. Rachuonyo North sub county map showing the position of Kendu sub county (formerly sub district) hospital (latitude 0° 21' 59.99" N and longitude 34° 38' 59.99" E).

Source: open source desktop geographic information system (QGIS 2.8.2).

3.2 Study Population

The study population was individuals living with HIV and AIDS in Rachuonyo North sub county, Homa Bay county. The target population was 1013 male and female patients living with HIV and AIDs aged 18 years and above and attending Kendu sub county hospital clinic. This age category was chosen by virtue of it being legally allowed to give informed consent to individually participate in a research in Kenya and it being the most active group both sexually and economically.

3.3 Research Design

Cross sectional research design was used in this study. This study design allowed the researcher to carry out the study at one time point and over a short period.

3.4 Sample Size Determination

The sample for this study was calculated using the Yamane (1967) formula i.e.:

$$n = \frac{N}{1 + N(e^2)}$$

Where n = required sample size.

N = the population

e = the level of precision at 95% confidence level

This gave a sample of 287 as follows:

$$n = \frac{1013}{[1 + 1013(0.05^2)]} = 287$$

The sample was adjusted upward by 10% to cater for non respondents. Thus the new sample size was 316.

3.5 Inclusion Criteria

Adult HIV positive patients (≥ 18 years of age) who have been on antiretroviral treatment therapy for six months and above, and gave their written/ thumb consent to participate in the study.

3.6 Sampling Technique

Study sample was drawn from HIV and AIDS patients attending Kendu sub county hospital's comprehensive care clinic. From the facility health records a total of 1013 adult (≥ 18 years) patients were active on ART hence this was used to form the sampling frame. Systemic sampling was used to select the study respondents. The first respondent was randomly selected and others were consecutively selected where by every 3rd patient who met the inclusion criteria was selected. The interval was calculated by taking the number of adult patients on ART by end of April 2016 which was six months prior to this study which was 1013. This was then divided by the sample size to get 3 ($1013/316=3.2$). This process continued on every clinic day until the sample size of 316 was reached.

3.7 Data Collection

Both primary and secondary data were collected. Primary Data on influence of patient related, clinical/medication and patient-provider relationship factors on adherence level were collected using self administered questionnaires (appendix I). The questionnaires were administered on scheduled clinic days. Only patients who consented were given questionnaires Patient registers provided secondary data that helped in determining respondents' eligibility as well as selection. 316 respondents that consented were issued with questionnaire in the waiting bay and submitted them before leaving the clinic.

3.8 Data Analysis and Presentation Techniques

In this study, questionnaire generated data were keyed into SPSS version 16. Data was coded and ascertained. Data completeness was also ascertained. Descriptive statistics (frequencies and percentages) was used to analyze data on demographic features. Inferential statistics (binary logistic regression analysis) was used to analyze influence of patient factors on antiretroviral

therapy adherence among people living with HIV and AIDS; medication factors influence on antiretroviral therapy adherence among people living with HIV and AIDS and patient-health provider relationship factors influence on the antiretroviral therapy adherence among people living with HIV and AIDS.

3.9 Ethical Consideration

Permission to conduct the study was sought from the school of graduate studies Maseno University and the management of Kendu Bay Sub County Hospital. Ethical approval was obtained from Maseno University ethical review committee (Appendix III). The study participants were consented (Appendix II) after being explained to the intended purpose and benefits of the study. The participants were as well informed of their rights and freedom to ask for more clarification and even opt out of the study at any time they deemed right. There were no monetary or material benefits that were provided to the respondents apart from the privilege of participating in a study aimed at improving care for HIV and AIDS patients as well contributing knowledge to scientific research. To ensure confidentiality of the study participants, the respondents was advised not to write their names or clinic numbers on the questionnaires but only use unique identification codes, data collected was stored safely by the researcher in a lockable cabinet in the researcher's office and the key was kept only by the researcher.

3.10 Study Limitations and Potential Biases

During the study, a number of limitations were encountered the main limitations being language barrier- some patients were not well conversant with English, some could not read and write while others were in a hurry to complete the questionnaires. Language barrier limitation was handled by translation of the tool into an understandable language (Dholuo). The respondents were advised to respond to questions keenly to avoid making mistakes.

3.11 Measurement of Variables

In this study patient related factors(distance, disclosure, Nondisclosure, poverty, stigma and denial, psychosocial support, daily schedule, lifestyle, literacy level and patient vision impairment), Medication factors (side effects, adverse drug reactions, dose complexity, co-morbid conditions and pill burden) and Patient provider factors (effective communication, provider's personality, professionalism and timeliness in service provision) were measured based on respondents self reports.

CHAPTER FOUR

RESULTS

This chapter reports study findings by presenting a comprehensive analysis of the data collected from the field. Results presented here include logistic binary regression results on influence of independent variables (patient factors, medication factors and patient-provider factors) on dependent variable (adherence to antiretroviral therapy). It also presents a discussion on the findings by comparing those findings with those of prior studies.

4.1 Response Rate

A total of 316 questionnaires were issued to the respondents according to the research sample size. All the 316 questionnaires were returned thus giving a response rate of 100%. This was made possible by issuing the questionnaires on clinic days and picking them back before the respondent left the clinic. Data was collected over a period of two weeks thus allowing the researcher time to monitor completeness of the questionnaires as well as clarify to the respondents where necessary.

4.2 Socio-Demographic Characteristics of the Study Participants

Table 4.1: Socio-Demographic Characteristics of Study Participants

Variable	Frequency	Percent
Respondents' Gender		
Male	136	43.0
Female	180	57.0
Total	316	100.0
Respondents' Age		
18-29 Years	80	25.3
30-39 Years	106	33.5
40-49 Years	63	19.9
50-59 Years	34	10.8
60-69 Years	27	8.5
70 Years and above	6	1.9
Total	316	100.0
Respondents' Marital Status		
Single	59	18.7
Married	196	62.0
Separated/Divorced	11	3.5
Widow	32	10.1
Widower	18	5.7
Total	316	100.0
Respondents' Level of Education		
Primary	132	41.8
Secondary	125	39.6
College	32	10.1
University	13	4.1
Others(adult education, informal education)	14	4.4
Total	316	100.0
Respondent's Occupation		
Jobless	32	10.1
Casual laborer	39	12.3
Employed	30	9.5
Farmer	72	22.8
Business person	123	38.9
Student	20	6.3
Total	316	100.0

Descriptive statistics showing Frequency distribution of study participants' socio-demographic characteristics of gender, age, marital status, level of education and occupation.

Demographic characteristics of the respondents in Table 4.1 above were based on gender, age, level of education, marital status and occupation. Based on gender, males were 43% (136) and Females were 57% (180), majority of the respondents were aged between 30 and 39 years (33.5%) followed by 18 to 29 years (25.3%) and 40 to 49 years (19.9%). Majority of the respondents were married (62 %). 41.8 % had attained primary level education and 39.6 % attaining secondary level education. 38.9 % of the respondents are doing business as an occupation and 22.8% are farmers.

4.3 Patient Factors Influencing Adherence to Antiretroviral Therapy

Table 4.2. Regression Results on Influence of Patient Factors on Adherence to ART.

Variable	Adherence		95% CI		Odds Ratio	P-Value
	Yes	No	Lower	Upper		
Distance	296	20	-.1080	-.049	-.078	.000
Disclosure	58	258	-.035	-.042	.003	.859
Non-disclosure	16	300	-.048	.022	-.013	.469
Poverty	39	277	-.038	.012	.021	8.015
Stigma and denial	301	15	-.160	-.089	-.124	.000
Social support	49	267	-.068	.006	-.031	.097
Busy daily schedule	60	256	-.051	.011	-.020	.202
Lifestyle	46	270	-.069	.001	-.034	.059
Literacy level	289	27	-.202	-.081	-.141	.000
Vision impairment	5	311	-.001	.067	.033	.055

The association of individual factors with adherence to ART was analyzed using binary regression model. The variables in bold were statistically significant and included distance, stigma and denial, and literacy level.

Table 4.2 above indicates that patient factors; distance (CI= -.1080, -.049; OR= -.078; $p = .000$), stigma and denial (CI= -.160, -.089; OR= -.124; $p = .000$) and literacy level (CI= -.202, -.081;

OR= -.141; $p= .000$) are statistically significant at $P<0.05$, while disclosure (CI= -.035, -.042; OR= .003; $p=.859$), non-disclosure (-.048, .022; OR= -.013; $p=.469$), poverty (CI= -.038, .012; OR= .021; $p= 8.015$), social support (CI= -.068, .006; OR= -.031; $p= .097$), busy schedule (CI= -.051, .011; OR= -.020; $p=.202$), lifestyle (CI= -.069, .001; OR= -.034; $p= .059$) and vision impairment (CI= -.001, .067; OR= .033; $p= .055$) are statistically insignificant at $P<0.05$. Long distances travelled to the hospital negatively influenced adherence to ART while shorter distances positively influenced adherence to ART. Stigma and denial negatively influenced adherence to ART. Low literacy level negatively influenced adherence to ART while high literacy level positively influenced adherence to ART.

4.4 Medication Factors Influencing Adherence to Antiretroviral Therapy

Table 4.3: Medication Factors Influencing Adherence to Antiretroviral Therapy

Variable	Adherence		95% CI		Odds Ratio	P- Value
	Yes	No	Lower	Upper		
Side Effects	313	3	-.207	-.072	-.139	.000
Adverse Drug Reactions	299	17	.185	.294	.239	.000
Dose Complexity	288	28	-.197	-.153	-.175	.000
Chronic and Comorbid Conditions	306	10	-.032	.058	.013	.568
Pill Burden	290	26	-.166	-.043	-.104	.001

The association of medication factors with adherence to ART was analyzed using binary regression model. The variables in bold were statistically significant and included side effects, adverse drug reactions, Dose complexity and pill burden.

Table 4.3 above indicates that, side effects (CI= -.207, -.072; OR= -.139; $p= .000$), adverse drug reaction (CI= .185, -.294; OR= .239; $p= .000$), dose complexity (CI= -.197, -.153; OR= -.175; $p= .000$) and pill burden (CI= -.166, -.043; OR= -.104; $p= .001$) are statistically significant at $P<0.05$. Chronic and comorbid conditions (CI= -.032, .058; OR= .013; $p= .568$) are statistically

insignificant at $P < 0.05$. Side effects, adverse drug reactions, dose complexity and pill burden negatively influence adherence to ART.

4.5 Patient-Health Provider Relationship Factors Influencing Adherence to Antiretroviral Therapy

Table 4.4: Influence of Patient Provider Relationship Factors on Adherence to Antiretroviral Therapy

Variable	Adherence		95% CI		Odds Ratio	P-Value
	Yes	No	Lower	Upper		
Effective communication	285	31	-.132	-.074	-.103	.000
Provider's personality and attitude	273	43	-.255	-.178	-.216	.000
Professionalism	286	30	-.188	-.122	-.155	.000
Timely services	295	21	-.406	-.270	-.338	.000

The association of patient-provider factors with adherence to ART was analyzed using binary regression model. The variables in bold were statistically significant and included effective communication, provider's personality and attitude, professionalism and timely services.

Table 4.4 above indicates that, effective communication (CI= -.132, -.074; OR= -.103; $p = .000$), health provider's personality and attitude (CI= -.255, -.178; OR= -.216; $p = .000$), professionalism (CI= -.188, -.122; OR= -.155; $p = .000$), and timeliness (CI= -.406, -.270; OR= -.338; $p = .000$) are statistically significant at $p < 0.05$. Effective communication between the health care providers' and the patient positively influence adherence to ART while ineffective communication negatively influence ART adherence. Health care providers' positive attitude and personality positively influenced ART adherence, health care provider negative attitude and personality discourages ART adherence. Providers' high professionalism level in caring for patients encourages adherence to ART as well as timely service delivery to patients.

CHAPTER FIVE

DISCUSSION

This chapter presents study discussion by presenting a comprehensive discussion of the study findings by comparing those findings with those of prior studies.

5.1 Patient Factors Influencing Adherence to Antiretroviral Therapy

This study aimed at looking at individual patient's factors influencing adherence to antiretroviral therapy. The finding shows that distance from home to the hospital influences adherence to ART ($P = .000$). This study finding was in line with Wasti *et al.*, (2012) who found that lack of transport fare and distance to the hospital to be barriers to adherence to antiretroviral therapy. This may also suggest that patients who travel long distances find it difficult to honor clinic appointments due to cost and time constraints. Stigma and denial also influence adherence to ART ($P = .000$). These finding is in line with studies by Nam *et al.*, (2008); Merten *et al.*, (2010), and Stutterheim *et al.*, (2012) whose studies showed stigma and denial to be among the factors influencing adherence to ART. This suggests that stigma and denial is still a challenge for people living with HIV and AIDS. People who are stigmatized tend to fail to open up thus not able to access essential services. One's literacy level influence antiretroviral adherence also ($P= .000$). In their studies, Marcus, (2006) and Waldrop-Valverde *et al.*, (2009) found that Illiteracy or low levels of health literacy or numeracy influenced one's ability to adhere to antiretroviral therapy. This may suggest that patients with low education level find it difficult to comprehend medical instructions as well as read labels on medicines packages. Other patient factors like disclosure ($P=.859$), non-disclosure ($P=.469$), poverty ($P=8.015$), social support ($P= .097$), busy schedule ($P= .202$), lifestyle ($P= .059$) and vision impairment ($P= .055$) are statistically insignificant at

$P < 0.05$. This may suggest that although these factors influence adherence in other settings, they are not having a significant influence in Kendu sub county hospital setting.

5.2 Medication Factors Influencing Adherence to Antiretroviral Therapy

This study aimed at determining medication factors influencing adherence to antiretroviral therapy. In the study, side effects influence adherence to antiretroviral medication ($P = .000$). This finding agrees with studies by Wei-Ti *et al.*, (2013), Phillips *et al.*, (2016) and Liying *et al.*, (2016) which found side effects of drugs influenced one's ability to adhere to medication. This suggests that though side effects are always expected whenever one takes medicine, they were more likely to influence one's ability to continue taking the medicine in cases of chronic illnesses like HIV and AIDS.

Adverse drug reactions influence adherence to ART $P = .000$. In a study by Tamburrino *et al.*, (2009), adverse drug reactions influenced ones compliance/adherence to medication. This suggests that adverse drugs reactions which are usually unexpected and undesired and obnoxious may discourage a patient on chronic medication to stop taking the drug especially if there are no alternatives.

Dose complexity on the other hand influence adherence to antiretroviral therapy ($P = .000$). This study finding is similar to studies by Muir *et al.*, (2001), South *et al.*, (2009) and Iacob *et al.*, (2017) that found dose complexity to influence adherence to ART. This suggests that patients who suffer from comorbid conditions that call for administration of a number of medications are more likely to fail to adhere. A good example of this being HIV patients suffering from tuberculosis, cancer or diabetes. Pill burden also influence antiretroviral therapy adherence ($P = .001$), this finding is similar to findings by of studies conducted by Gianotti *et al.*, (2013)

and Clay *et al.*, (2015) which found that people who were taking larger numbers of pills reported poorer adherence and a significantly higher adherence in patients with a once-daily fixed-dose (“single tablet regimen”). This gives a suggestion that the number and size of pills one takes per day may influence his/her ability to continue to take them. HIV treatment is a lifelong exercise and involves daily administration of a number of pills whose sizes are also huge and more likely to discourage a number of patients. However, chronic and co-morbid conditions were found to be statistically insignificant ($P= .568$). This may suggest that comorbidities are not a strong reason for failing to adhere in Kendu sub county hospital setting.

5.3 Patient-Health Provider Factors Influencing Adherence to Antiretroviral Therapy

Effective communication significantly influence adherence to ART ($P= .000$). This is in line with studies by Branch (2000), Catz *et al.*, (2000), Dybul *et al.*, (2002), Martin *et al.*, (2005) and Herrmann *et al.*, (2008) whose studies showed that effective communication by the health provider to the patient improved drug adherence. This suggests that health providers who communicate the medication instructions to patients lead to clear understanding by the patient thus promoting adherence. Healthcare provider’s personality and attitude also significantly influence adherence to ART ($P= .000$). This is supported by studies by O'Malley *et al.*, (2002) and Beach *et al.*, (2005) which found that health provider’s attitude and personality influenced adherence to ART. This suggests that health providers that are perceived by patients to be friendly, kind, understanding and warm, encourage adherence to ART. Provider’s professionalism competence also influence adherence ($P= .000$). Abbo *et al.*, (2008), and Munderi *et al.*, (2012) in their studies found that provider’s professionalism influenced patients’ adherence to ART. This may suggest that patients’ perception of the provider’s competence improve their confidence in the treatment thus positively influencing their adherence.

Professionalism traits like confidentiality, privacy patient involvement in treatment plan and good choice of words while explaining an issue are important in improving patients' confidence in medication. Timeliness in service delivery influence adherence to ART ($P= .000$). This study finding agrees with the findings by Kunihiro *et al.*, (2010), and McCarthy *et al.*, (2017) who found that crowded HIV treatment facilities with long patient wait times deter patients from attending their clinical appointments and picking up their medications, ultimately disrupting patient care and compromising patient retention and adherence. This suggests that patients especially those with tight daily schedules like the business people or in employment may fail to adhere to clinic appointments thus failure to access medicines and adhere to treatment.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter reports study summary of findings by presenting a comprehensive conclusion of the study findings. It also presents a discussion on the recommendations of the study and suggestions for further research.

6.1 Summary

Patient factors that influence adherence to antiretroviral therapy in Kendu Sub-county hospital include: distance from home to the hospital, stigma and denial and literacy level.

Medication factors that were found to influence antiretroviral adherence include: Side effects, adverse drug reaction, dose complexity and pill burden.

Patient- provider relationship factors that influence antiretroviral adherence are: effective communication, provider's personality and attitude, professionalism, and timeliness.

6.2 Conclusions

Factors influencing ART adherence among HIV positive patients attending Kendu Sub-county hospital include; Patient factors like distance, stigma and denial, and literacy level; Medication factors comprising of drug side effects, adverse drug reaction, dose complexity and pill burden; and patient-health care provider relationship factors comprising of effective communication, provider's personality and attitude, professionalism, and timeliness in service provision.

6.3 Recommendations

1. Patient factors like distance, stigma and denial and literacy level should be given consideration by the national government when, designing where to set up health

facilities, carrying out population sensitization campaigns, population education system/plan, and treatment plan for patients with the intention of improving or enhancing adherence to medication particularly ART regimen.

2. Medication factors like side effects, adverse drug reaction, dose complexity and pill burden should be factored in the patient management standards and procedures by ministry of health and pharmaceutical companies in order to improve adherence to ART.
3. Patient-health provider relationship factors should be given special attention while training health care providers both in learning institutions and on-job trainings in order to improve the working relationship between the healthcare providers and their clients. Emphasis should be put on effective communication, personality and attitude, professionalism, and timeliness issues in service provision.

6.4 Areas for Further Studies

Further studies need to be done on prevalence and factors influencing pediatric adherence to antiretroviral therapy in Homa Bay County.

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APPENDICES

Appendix I: Questionnaire

Preamble

This study is being carried out in order to determine Factors Influencing Antiretroviral Therapy Adherence 1 in Adult HIV Positive Patients Attending Kendu Bay Sub County Hospital, Homa Bay County, Kenya. This study is strictly for academic and research purpose only but the findings of this study will help care givers and the people on ARVs develop a plan that will help improve their adherence to medication. The information provided will be highly valued and shall be treated with utmost confidentiality.

(I) Socio-Demographic Characteristics

1. Gender: Male Female
2. Age: (i) 18-29 years (ii) 30-39 years (iii) 40-49 years
(iv) 50-59 years (v) 60-69 years (vi) 70 years and above
3. Level of education: (i) Primary (ii) Secondary
(iii) College (iv) University (v) Others
4. Marital status: (i) Single (ii) Married (iii) separated/divorced (v) widower
(vi) Widow
5. Main source of income/occupation: (i) Jobless (ii) casual laborer (iii) Employed
(iv) Farmer (v) Business (vi) Student

(II) Patient Factors Influencing Antiretroviral Therapy Adherence

- 6(a) has **distance** to your clinic been affecting your adherence to your ARV medications?
(i) Yes (ii) No
- (b) If yes, to what extent has **distance** affected your adherence level to ARVs?
(i) No extent (ii) Very little extent (iii) Little extent (iv) Great extent (v) Greater extent
- 7(a) has **disclosure** of your HIV status been affecting your adherence to your ARV medications?
(i) Yes (ii) No
- (b) If yes, to what extent has **disclosure** influenced your adherence level to ARVs?
(i) No extent (ii) Very little extent (iii) Little extent (iv) Great extent (v) Greater extent
- 8(a) has **Non-disclosure** of your HIV status influenced your adherence to your ARV medications?

(i) Yes () (ii) No ()

(b) If yes, to what extent has **Non-disclosure** influenced your adherence level to ARVs?

(i) No extent() (ii) Very little extent() (iii) Little extent() (iv) Great extent() (v) Greater extent()

9(a) has **poverty** influenced your adherence to your ARV medications?

(i) Yes () (ii) No ()

(b) If yes, to what extent has **poverty** affected your adherence level to ARVs?

(i) No extent() (ii) Very little extent() (iii) Little extent() (iv) Great extent() (v) Greater extent()

10(a) has **stigma and denial** influenced your adherence to ARV medications?

(i) Yes () (ii) No ()

(b) If yes, to what extent has **stigma and denial** influenced your adherence level to ARVs?

(i) No extent() (ii) Very little extent() (iii) Little extent() (iv) Great extent() (v) Greater extent()

11(a) has **social support** influenced your adherence to your ARV medications?

(i) Yes () (ii) No ()

(b) If yes, to what extent has **social support** influenced your adherence level to ARVs?

(i) No extent() (ii) Very little extent() (iii) Little extent() (iv) Great extent() (v) Greater extent()

12(a) has your **daily schedule** influenced your adherence to your ARV medications?

(i) Yes () (ii) No ()

(b) If yes, to what extent has **daily schedule** influenced your adherence level to ARVs?

(i) No extent() (ii) Very little extent() (iii) Little extent() (iv) Great extent() (v) Greater extent()

13(a) has your **lifestyle** (stressful life, lack of support) influenced your adherence to your ARV medications?

(i) Yes () (ii) No ()

(b) If yes, to what extent has your **lifestyle** influenced your adherence level to ARVs?

(i) No extent () (ii) Very little extent() (iii) Little extent() (iv) Great extent() (v) Greater extent()

14(a) has **vision impairment** influenced adherence to your ARV medications?

(i) Yes () (ii) No ()

(b) If yes, to what extent has **vision impairment** influenced your adherence level to ARVs?

(i) No extent() (ii) Very little extent() (iii) Little extent() (iv) Great extent() (v) Greater extent()

15(a) has your **ability to read and write** influenced your adherence to your ARV medications?

(i) Yes () (ii) No ()

(b) If yes, to what extent has **ability to read and write** influenced your adherence to ARVs?

(i) No extent() (ii) Very little extent() (iii) Little extent() (iv) Great extent() (v) Greater extent()

(III) Medication Factors Influencing Adherence

16(a) has **drugs side effects** influenced your adherence to your ARV medications?

(i) Yes () (ii) No ()

(b) If yes, to what extent has **drugs side effects** influenced your adherence to ARVs?

(i) No extent() (ii) Very little extent() (iii) Little extent() (iv) Great extent() (v) Greater extent()

17(a) has **drugs adverse reactions** influenced your adherence to your ARV medications?

(i) Yes () (ii) No ()

(b) If yes, to what extent has **adverse reactions** influenced your adherence to ARVs?

(i) No extent() (ii) Very little extent() (iii) Little extent() (iv) Great extent() (v) Greater extent()

18(a) has **dose complexity of ARVs** influenced your adherence to your ARV medications?

(i) Yes () (ii) No ()

(b) If yes, to what extent has **dose complexity of ARVs** influenced adherence?

(i) No extent() (ii) Very little extent() (iii) Little extent() (iv) Great extent() (v) Greater extent()

19(a) has **Chronic and Co-morbid Conditions** influenced your adherence to your ARV medications?

(i) Yes () (ii) No ()

(b) If yes, to what extent has **Chronic and Co-morbid Conditions** influenced your adherence level to ARVs?

(i) No extent() (ii) Very little extent() (iii) Little extent() (iv) Great extent() (v) Greater extent()

21(a) has **pill burden** influenced your adherence to your ARV medications?

(i) Yes () (ii) No ()

(b) If yes, to what extent has **pill burden** influenced your adherence level to ARVs?

(i) No extent() (ii) Very little extent() (iii) Little extent() (iv) Great extent() (v) Greater extent()

(IV) Patient- Health Provider relationship Factors Influencing Adherence to ART

22(a) has your health care provider been **effectively communicating** to you on your medication?

(i) Yes () (ii) No ()

(b) If yes, to what extent has **effective communication** influenced your adherence to ARVs?

(i) No extent() (ii) Very little extent() (iii) Little extent() (iv) Great extent() (v) Greater extent()

23(a) has your health care **provider personality and attitude** influenced your adherence to your ARV medications?

(i) Yes () (ii) No ()

(b) If yes, to what extent has **provider personality and attitude** influenced your adherence to ARVs?

(i) No extent() (ii) Very little extent() (iii) Little extent() (iv) Great extent() (v) Greater extent()

24(a) has your provider been exhibiting **professionalism** while attending to you?

(i) Yes () (ii) No ()

(b) If yes, to what extent has provider **professionalism** influenced your adherence to ARVs?

(i) No extent() (ii) Very little extent() (iii) Little extent() (iv) Great extent() (v) Greater extent()

25(a) has **short waiting time** at the clinic influenced your adherence to your ARV medications?

(i) Yes () (ii) No ()

(b) If yes, to what extent has **short waiting time** at the clinic influenced your adherence level to ARVs?

(i) No extent() (ii) Very little extent() (iii) Little extent() (iv) Great extent() (v) Greater extent()

26. in the last 30 days, how many **doses** have you missed? (recall)

(i) 3 Doses and below () (ii) 4 Doses () (iii) 5 Doses () (iv) 6 Doses ()

Appendix II: Informed Consent Form

INFORMED CONSENT FORM

Investigator:

“My name is **Wycliffe Dunde** and I am a graduate student at Maseno University, school of public health and community development. I am inviting you to participate in a research study. Involvement in the study is voluntary, so you may choose to participate or not. I am now going to explain the study to you. Please feel free to ask any questions that you may have about the research; I will be happy to explain anything in greater detail.

I am interested in learning more about **Factors Influencing Antiretroviral Therapy Adherence Level in Adult HIV Positive Patients Attending Kendu Bay Sub County Hospital, Homa Bay County, Kenya**. You will be asked to complete a self administered questionnaire, participate in an interview or focus group discussion. This will take approximately 15-30 minutes of your time.

All information will be kept confidential.

The benefit of this research is that you will be helping us to understand factors influencing adherence to antiretroviral medication. This information should help us to improve HIV and AIDS management services. There are no risks associated with this study. If you do not wish to continue, you have the right to withdraw from the study, without penalty, at any time”.

Participant:

“All of my questions and concerns about this study have been addressed. I choose, voluntarily, to participate in this research project. I certify that I am at least 18 years of age”.

Participant’s

Name.....

Participant’s Signature.....

Investigator’s Name.....

Investigator’s Signature.....

Contacts:

Investigator: +254713270802

Ethical Review Committee: +254057351622 Ext 3050

Appendix III: Ethical Review Committee Clearance



MASENO UNIVERSITY ETHICS REVIEW COMMITTEE

Tel: +254 057 351 622 Ext: 3050
Fax: +254 057 351 221

Private Bag – 40105, Maseno, Kenya
Email: muerc-secretariat@maseno.ac.ke

FROM: Secretary - MUERC

DATE: 13th June, 2016

TO: Wycliffe Ondiek Dunde
EL/ESM/00402/2013
Department of Public Health
School of Public Health and Community Development
Maseno University
P. O. Box, Private Bag, Maseno, Kenya

REF: MSU/DRPI/MUERC/00283/16

RE: Factors Influencing Antiretroviral Therapy Adherence Level in Adult HIV Positive Patients attending Kendu Bay Sub County Hospital, Homabay County, Kenya. Proposal Reference Number: MSU/DRPC/MUERC/00283/16

This is to inform you that the Maseno University Ethics Review Committee (MUERC) determined that the ethics issues raised at the initial review were adequately addressed in the revised proposal. Consequently, the study is granted approval for implementation effective this 13th day of June, 2016 for a period of one (1) year.

Please note that authorization to conduct this study will automatically expire on 12th June, 2017. If you plan to continue with the study beyond this date, please submit an application for continuation approval to the MUERC Secretariat by 13th June, 2017.

Approval for continuation of the study will be subject to successful submission of an annual progress report that is to reach the MUERC Secretariat by 13th June, 2017.

Please note that any unanticipated problems resulting from the conduct of this study must be reported to MUERC. You are required to submit any proposed changes to this study to MUERC for review and approval prior to initiation. Please advise MUERC when the study is completed or discontinued.

Thank you.

Yours faithfully,

Dr. Bonuke Anyona,
Secretary,
Maseno University Ethics Review Committee.



Cc: Chairman,
Maseno University Ethics Review Committee.

MASENO UNIVERSITY IS ISO 9001:2008 CERTIFIED



Appendix IV: Budget

S/n	Item	Quantity	Unit price	Total cost
1	Photocopying papers	5	500	2,500.00
2	Notebooks	5	65	325.00
3	Pencils	10	30	300.00
4	Computer services	1	5,000	5,000.00
5	Typing Services	1	5,000	5,000.00
6	Binding	20	70	1400
7	Internet	1	2,000	2,000.00
8	Flash disk	1	2,000	2,000.00
9	Photocopying	20	200	4000
10	Data Collection and travels	5	3,000	15,000.00
11	Data collection Assistants	2	10,000	20,000
14	meals during field work	15	300	4,500.00
15	Purchase of SPSS software	1	10,000	10,000.00
16	Data Analysis	1	20,000	20,000.00
GRAND TOTAL				90,025