

**THE ASSOCIATION BETWEEN DEPRESSION AND NON-ADHERENCE TO
ANTIRETROVIRAL THERAPY AMONG PREGNANT WOMEN LIVING WITH
HIV**

**A CROSS-SECTIONAL STUDY AT THE ANTENATAL CLINIC OF KIBERA
SOUTH HEALTH CENTRE, NAIROBI**

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS	iii
LIST OF TABLES	vii
LIST OF FIGURES	viii
ACRONYMS AND ABBREVIATIONS USED	ix
DEFINITION OF TERMS USED.....	x
ABSTRACT.....	xi
CHAPTER 1: INTRODUCTION.....	1
1.1 Problem statement.....	2
1.2 Rationale.....	3
1.3 Research question.....	3
1.4 Hypothesis.....	4
1.5 Broad objective	4
1.6 Specific objectives.....	4
1.7 Conceptual framework	4
CHAPTER 2: LITERATURE REVIEW	6
2.1 Prevalence of depression in pregnant women who are living with HIV.....	6
2.2 Factors associated with depressive symptoms among pregnant women who are living with HIV	7
2.3 Adherence to Anti-Retroviral Therapy	8
2.4 Factors associated with Non-Adherence to ART during pregnancy.....	9
2.5 Perinatal depression and adherence to HIV medication.....	11
2.6 Theoretical Model of Depression.....	12
CHAPTER 3: STUDY DESIGN AND METHODOLOGY	14
3.1 Study design	14
3.1.1 Study area description	14
3.2 Study population	15
3.2.1 Inclusion criteria.....	15
3.2.2 Exclusion criteria.....	15
3.3 Sample size determination	15
3.4 Sampling method.....	16

3.5 Recruitment and consenting procedures	16
3.6 Data collection procedures	17
3.7 Data collection instruments	17
3.7.1 Socio demographic questionnaire	17
3.7.2 Edinburgh Post-Partum Depression Scale (EPDS)	18
3.7.3 The Center for Adherence Support Evaluation (CASE) adherence index	18
3.8 Variables.....	19
3.8.1 Dependent variables	19
3.8.2 Independent variables	19
3.8.3 Associated factors.....	19
3.8.4 Materials	19
3.9 Quality assurance procedures.....	19
3.10 Ethical consideration.....	22
3.11 Data management.....	24
3.12 Use of the study.....	24
3.13 Role of investigator.....	24
3.14 Role of supervisors.....	25
3.14 Timeframe	25
CHAPTER 4: RESULTS	26
4.1 Introduction	26
4.2 Response rate.....	26
4.2.1 Socio Demographic and clinical characteristics of respondents	26
4.3 Negative self-perceived stigma	29
4.4 Prevalence of depression.....	30
4.5 Sociodemographic factors associated with depression	30
4.6 Pregnancy, HIV related characteristics and other factors associated with depression	32
4.7 Multivariate analysis of depression.....	34
4.8 ART medication adherence.....	36
4.9 Socio-demographic factors associated with non-adherence.....	36

4.10 Pregnancy, HIV related characteristics and other factors associated with non-adherence.....	38
4.11 Multivariate analysis (Predictors of non-adherence)	40
CHAPTER 5: DISCUSSION	41
5.1 Study limitations	43
5.2 Conclusion.....	43
5.3 Recommendations	44
REFERENCES.....	45
APPENDICES	50
Appendix I: Informed Consent Form	50
Appendix II: Consent Form.....	52
Appendix III: Swahili Version	53
Appendix V: Hati ya Ridhaa	55
Appendix VI : Edenburg Perinatal Depression Scale	56
Appendix VII: Fomu ya Mizani ya Edinburgh (EPDS).....	57
Appendix VIII: Case adherence index questionnaire.....	60
Appendix IX: Researcher Designed Questionnaire	62
Appendix X: Dodoso Lilioundwa na Mtafiti	66

LIST OF TABLES

Table 4.1: Respondents Socio-demographic Profiles (N=136)	28
Table 4.2: Negative self-perceived stigma.....	29
Table 4.3: Socio-demographic factors associated with depression	31
Table 4.4: Pregnancy, HIV related characteristics and other factors associated with depression	33
Table 4.5: Multivariate analysis (Predictors of depression)	35
Table 4.6: Socio-demographic factors associated with adherence	37
Table 4.7 Pregnancy, HIV related characteristics and other factors associated with non-adherence	39
Table 4.8: Multivariate analysis (Predictors of non-adherence).....	40

LIST OF FIGURES

Figure 2.1: Theoretical Model of Depression	13
Figure 3.1: Flow chart.....	21
Figure 4.1: Prevalence of depression	30
Figure 4.2: Case adherence index scoring	36

ACRONYMS AND ABBREVIATIONS USED

AIDS	-	Acquired immune deficiency Syndrome
ANC	-	Ante Natal Clinic
ART	-	Anti retroviral Therapy
ARVS	-	Anti - Retro - Viral
CASE INDEX-		Center for Adherence Support Evaluation (CASE) Adherence Index
CCC	-	Comprehensive Care Clinic
DSM IV	-	Diagnostic Statistical Manual of Mental disorders, Fourth Edition
EPDS	-	Edinburgh postnatal Depression scale
HAART	-	Highly Active Anti-Retroviral Therapy
HIV	-	Human Immunodeficiency Virus
KAIS	-	Kenya AIDS Indicator survey
KNH	-	Kenyatta National Hospital
KSHC	-	Kibera South Health Centre
LMIC	-	Lower- and Middle-Income Countries
NASCOP	-	National Aids and Sexually Transmitted Infections Control Programme
PHQ	-	Patient Health Questionnaire
PMTCT	-	Prevention of Mother to Child Transmission of HIV
SPSS	-	Statistical package for social sciences
UNICEF	-	United Nations International Children's Emergency Fund
WHO	-	World Health Organization

DEFINITION OF TERMS USED

Active Patient: Patient who has been registered for follow up care and receives regular ART at a given facility.

Adherence: This word has been used to refer to the extent to which the patients follow instructions of their health care providers; this is in regard with taking their medicines at the right time.

Antenatal depression: Any form of clinical depression affecting women during pregnancy

Maternal depression: It is an all-encompassing term used for a spectrum of depressive conditions that can affect mothers during pregnancy and even up to twelve months post-delivery. These include prenatal depression, postpartum depression and/or postpartum psychosis.

New Patient: Patient who has been newly diagnosed to be HIV positive and enrolled for care

Optimal adherence: This means a patient is taking 95% or more of the prescribed pill in a given time

Option B+: It is a PMTCT strategy which requires that all pregnant newly diagnosed with HIV, are started on triple ARV for life regardless of their CD4 count.

Perinatal depression: Any form of clinical depression affecting women during pregnancy

Suboptimal adherence: This means that a patient is taking less than 95% of the prescribed pills in a given time

Treatment naive patient: This is a patient who has never taken any ART for their infection

Treatment regimen: The combination of anti-retro-viral drugs prescribed for a HIV positive pregnant mother.

ABSTRACT

Background: Depression is progressively becoming a worldwide concern. Lower and middle-income countries carry a higher burden of maternal depression. Depression in the period of pregnancy particularly in context of HIV is of worrying because of its possible impact on maternal and child health. Depression may interfere with HIV care as studies have demonstrated a relationship between depression and non-adherence to Anti-Retroviral Treatment. Poor adherence to Anti-Retroviral Therapy during pregnancy increases the likelihood of mother to child transmission of HIV

Objective: This study aimed at establishing whether there is a relationship between depression during pregnancy and adherence to ART amongst the pregnant women who are living with HIV and were attending clinic at the Kibera South Health Centre.

Study Design: Cross sectional study

Methodology: Pregnant women living with HIV were screened for depression using the EPDS. Data on adherence to ART was collected using the CASE adherence index. A researcher designed questionnaire was administered to obtain data on socio-demographic, psychological, and practical barriers to care and engagement with health care facility.

Data analysis: Data entry and analysis was carried out using SPSS version 21. Socio-demographic and clinical variables were represented in frequency tables. This was followed by bivariate analysis whereby the factors associated with depression and also factors associated with non-adherence were determined. Finally, a multivariate analysis was done to determine the risk factors in both depression and non-adherence among the respondents

Results: 35% of the pregnant women living with HIV at Kibera South Health Centre suffered from depression. 24.3 % of them were non-adherent to ART medication.

Risk factors associated with depression were young maternal age 18 to 24 years OR=10.39, 95% CI (2.52-42.75). Other risk factors for depression were experience of

intimate partner violence OR=5.27, 95% CI (2.13-13.00). Young maternal age (18 to 23 years) was also associated with non-adherence, OR=6.84, 95% CI (1.67-28.08)

After adjusting for all other factors associated with non-adherence; we found out that participants who were not depressed had significantly lower levels of non-adherence to ART medication; AOR=0.18;(p=0.017)

Conclusion: Depression in HIV infection leads to non-adherence to ART medication. Participants who were not depressed had significantly lower levels of non-adherence to ART medication; AOR=0.18;(p=0.017)

These findings highlight the need to address mental health issues particularly depression in pregnancy in terms of assessment & treatment. This will in turn serve as a mechanism to ensure good adherence and therefore provide further support for the current effort to eliminate mother to child transmission of HIV in Kenya.

CHAPTER 1: INTRODUCTION

Maternal depression is increasingly becoming a worldwide public health concern. According to WHO report (WHO, 2015), It was reported that Worldwide about 13% of post-natal women and 10% of pregnant women experience a mental disorder, depression being the most common. (LMIC) have a higher burden of maternal depression. It has been reported that 15% of pregnant women in developing countries experience and about 19.8% of women experience depression after child birth (WHO, 2015).

Depression during pregnancy particularly in the context of HIV is an issue of concern; this is because it has an impact on the mother and also the child. Depression may interfere with HIV care as studies have demonstrated a relationship between depression and non-adherence to ART (Kumar, 2012; Psaros et al., 2009).

Non-adherence to ART is during pregnancy increases the risk of transmission of HIV from the mother to the child (Kupetanovic et al., 2009; Nachega et al., 2011). Near perfect levels of adherence is therefore necessary so as to achieve optimal viral suppression. Anti/retroviral treatment during pregnancy not only treats the mother's underlying disease, but also aims at preventing vertical perinatal HIV transmission to the child. It is said that even minor deviations from the prescribed regimen increases the risk for mother to child transmission of HIV.

Adherence to ART is dynamic, success of HIV treatment is highly dependent on strict adherence to ART. Prevention of mother to child transmission of HIV is also dependent on strict adherence to ART. ART requires high level (95%) adherence. Although few studies have investigated the effect depression could have on adherence to ART, Campos et al, 2010 demonstrated that HIV patients with depressive symptoms may interrupt regimen. (Kumar, 2012) and (Psaros et al., 2009) also associate depressive symptoms with non-adherence to ART. Increased healthcare contact during pregnancy may therefore provide opportunity for screening for depression and intervention. Early identification of depression and subsequent treatment may improve pregnancy outcomes.

Maternal depression, strict adherence to ART remains a challenge that has important implications for treatment success.

1.1 Problem statement

The consequences of depression and non-adherence to ART during pregnancy are dire. Studies have shown that among pregnant women living with HIV, perinatal depression may not only compromise maternal clinical outcomes; but also, it may compromise child health outcomes. A study carried out in Uganda (Kaida et al., 2011) Found high depression prevalence among the pregnant women living with HIV at treatment initiation.

Poor adherence to ART is associated with HIV disease progression (Bailey et al, 2014). During pregnancy it known to increase the risk of mother to child transmission of HIV. A report from the national Aids Control Council of Kenya (NASCOP, 2012) indicated that HIV/AIDS transmission from mother to child in Kenya is still one of the biggest health and developmental challenge.

According to Karp 2014, Child HIV infection from HIV positive mothers has remained largely stable at about 14% in the previous three years. There is need therefore to address all the barriers to adherence to ART medication if Kenya is to achieve the global target of eliminating mother to child transmission of HIV. Data shows that the country has continued to scale up PMTCT services; however, there is still the presence of child HIV infections from the mother.

In as much as depression has been reported to be among the most prevalent psychiatric disorders during pregnancy, most studies of maternal depression have mainly focused on post-natal depression. Adherence to ART during pregnancy remains understudied. Despite the fact that research has shown a significant relationship between depression and adherence to ART, published data on depression and adherence to ART among pregnant women in Kenya is limited. Therefore, this study intends to generate knowledge about the relationship between depression and the rates of adherence to ART among pregnant women living with HIV.

1.2 Rationale

The consequences of non-adherence to ART during pregnancy are far reaching as it increases the risk of transmission of HIV to the unborn child. It is therefore of concern to investigate the barriers of adherence to ART among the pregnant women who are living with HIV. Studies among the general population have demonstrated a relationship between depression and non-adherence to ART. It is therefore of concern if pregnant women who are depressed are less likely to adhere to ART. In other words, these this undermines the global target to eliminate mother to child transmission of HIV.

A higher percentage (90%) of pregnant women with HIV worldwide are residing in sub-Saharan Africa (UNAIDS 2012). It is therefore critical to have a better understanding of the relationship between depression and adherence to medication; particularly ART. This will help in the development of targeted interventions aimed at improving adherence to ART and this will in turn help in the fight towards elimination of mother to child transmission of HIV. It is in this regard that this research is proposed so as to generate useful information about depression, adherence to ART, and the barriers that impact maternal mental health and thereby adherence.

1.3 Research question

There are a number of questions that the research tried to seek answers for. The key question the research aimed to answer was whether there is an association between depression and non-adherence to ART among pregnant women who are living with HIV. A subset of related questions that followed this were:

- i. What is the prevalence of clinical depression among the pregnant women who are living with HIV?
- ii. What is the adherence rate to ART in depressed pregnant women living with HIV and what is the rate of adherence to ART in pregnant women who are living with HIV and are not depressed?
- iii. What are the key psychological and practical barriers to adherence to ART among pregnant women living with HIV

1.4 Hypothesis

1.4.1 Null hypothesis

There is no difference in the rate of adherence to ART among depressed pregnant women living with HIV compared to non-depressed pregnant women living with HIV.

1.4.2 Alternative hypothesis

The compliance rate among depressed pregnant women living with HIV is significantly lower than that of non-depressed pregnant women living with HIV. Poor social support, perceived negative stigma and heightened barriers to care act as effect modifiers increasing burden of mental health disorders like depression

1.5 Broad objective

The main objective of the study was to establish whether there is an association between antenatal depression and adherence to ART among the pregnant women living with HIV, attending Kibera south Health Centre-ante natal clinic.

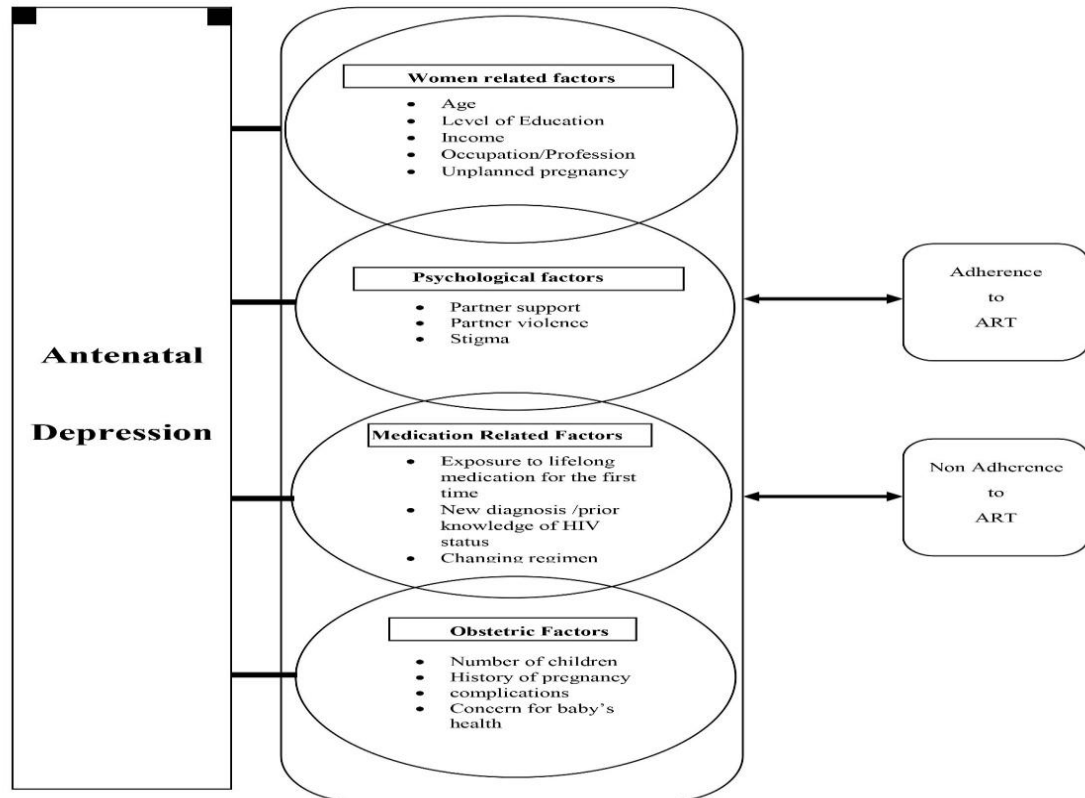
1.6 Specific objectives

- i. To determine socio-demographic characteristics of the pregnant women who are living with HIV and are on ART at Kibera South health Centre
- ii. To determine the prevalence of depression among pregnant women living with HIV
- iii. To assess the rates of adherence to ART among the participants

1.7 Conceptual framework

Pregnancy and child birth bring many physical and psychological changes. Anxiety and depression are among the most common psychological disorders during pregnancy and postpartum. Adherence to ART in pregnancy of great importance, as minor deviations increase the risk of vertical transmission of HIV from mother to the baby. It is said that quite a number of factors may impact on adherence rates among patients with HIV/AIDS. These factors could include drug related factors such as; drug side-effects, regimen complexity or they could be patient related factors such as patients' age, depression or other physical challenges in accessing care. For patients, adherence means adhering to

daily or twice a day medication schedule. In pregnancy however, better compliance to ART could be attributed to mothers' concern for baby's health.



CHAPTER 2: LITERATURE REVIEW

2.1 Prevalence of depression in pregnant women who are living with HIV

Studies on the prevalence of depressive symptoms during pregnancy have found a higher rate of depressive symptoms among the women who were living with HIV as compared to the women who did not have HIV (Manikkam & Burns 2012; Natamba, et al., 2014). However other studies have not demonstrated such a difference (Bonacquisti, Geller & Aaron 2014; Rochat et al., 2006).

In Ukraine, also a lower- and middle-income country in Europe and also having one of the most severe HIV epidemics, (UNAIDS 2013), the prevalence of depressive symptoms among pregnant women living with HIV is at 27% (Bailey et al 2016). This was in a cross-sectional study whereby; depressive symptoms were assessed using PHQ-2 (Two screening questions were administered). It was found that 49 out of 180 pregnant women screened positive of depression (Bailey et al., 2016).

Findings from Most Sub-Saharan African countries indicate that 15%–50% of women living with HIV screen positive for probable depression (Kinyanda et al., 2011). Uganda is considered a setting with a high prevalence of HIV (7.2%) (UNAIDS, 2013), with the women having a higher prevalence rate (8.2%) than the men (6.1%). It is therefore an important setting to compare with Kenya, because just like Kenya, Uganda also adopted “Option B+” in the treatment of HIV among pregnant women.

Prevalence of probable depression among pregnant women living with HIV in Uganda was at 39% (Kaida et al., 2014). The modified Hopkins Symptom Checklist was used to screen for depression. With a sample size of 407 pregnant women living with HIV it was observed that the prevalence of depression was higher at ART initiation. In a cohort study in Dar es Salaam, Tanzania 1048 pregnant women living with HIV were assessed for depression using the HSCL-25. It was found that the prevalence of depression was at 42.4% (Fawzi et al., 2007).

Peltzer et al, (2016) in primary health care facilities based in rural South Africa found that the rates of depression among pregnant women living with HIV to be 48.7%. This was done using the EPDS. In Kenya, depression among the pregnant women living with HIV remains under studied. Waititu et al, (2016) at KNH found the prevalence of depression among the general adult population living with HIV to be at 23.3 % Findings from a cross sectional study in Kenya also at KNH, Yator et al, (2016) suggested that rates of depression were high in HIV positive women within 8 weeks post-delivery. Using the EPDS 36 participants (29%) out of 123 women who participated endorsed having some type of suicidal ideation

2.2 Factors associated with depressive symptoms among pregnant women who are living with HIV

There are several factors that have been found to be associated with depressive symptoms among pregnant women living with HIV. Socio-demographic factors identified include young maternal age (Hartley et al., 2011). In Uganda being married as compared to having a marital status of ‘never married’ was associated with higher levels of depressive symptom. (Kaida et al., 2014). In this it was found that there is an independent lower depression risk among “never married” participant compared with those participants who were married at the time of the study. This therefore contrasts findings from other studies which generally suggest the protective effect of marriage. In Kenya it was found that the health benefits of marriage were highly gendered with women having fewer protective benefits as compared to the men (Wanic et al., 2011).

Manikkam & Burns (2012) associated single marital status with depression among the pregnant women who are living with HIV. Financial insecurity has also been shown to increase depressive symptoms among this population; (Hartley et al., 2011). Other factors identified are health-related factors to include being in poor physical health status (Kaida et al, 2014) and also having suffered from a previous episode of depression (Kaaya et al., 2010; Manikkam & Burns, 2012).

Psychosocial variables, found to be associated with depressive symptomatology include; absence of emotional support (Ross et al, 2009), the presence of social isolation (Blaney et al., 2004). Lower perceived social support (Stewart et al., 2014), and lack of partner support have also been associated with depressive symptoms (Hartley et al., 2011; Makin, Sikkema & Forsyth, 2013).

Pregnancy related factors include having an unplanned pregnancy (Manikkam & Burns, 2012). The experience of intimate partner violence (Hartley et al, 2011; Stewart et al, 2014) have also been associated with depressive symptoms among pregnant women living with HIV

2.3 Adherence to Anti-Retroviral Therapy

Establishing and maintaining adherence to medication are difficult issues for individuals with any chronic illness (Kumar, 2012). In the strive to eliminate Mother to child transmission of HIV it is essential to have information pertaining adherence to ART both during pregnancy and postnatally. However; in Kenya little pertaining adherence to ART during pregnancy has been published. With the recent increasing access to antiviral treatment in the developing countries it is therefore crucial to understand factors in terms of the motivators and the barriers of adherence to ART.

Globally the rate of adherence to ART among pregnant women was found to be 72% (Nachega et al., 2012). This was a systematic review whereby available data regarding adherence to ART during the period of pregnancy and after delivery were summarized. In Kenya, non-adherence rate in general population is reported to be at 10% (KAIS, 2012). These findings highlighting the success of the Kenyan national ART program, however it points the need for targeted interventions to improve adherence outcomes.

A cross sectional study by (Wakibi et al., 2011) done to identify factors responsible for non-adherence to ART in Kenya, 403 respondents were interviewed in Nairobi, 72 (18%) respondents had a scored 10 or below on the CASE index which is indicative of non-adherence. In this study 331 (82%) had a score above 10, this therefore suggesting adherence (Wakibi et al., 2011).

In another cross-sectional study in Kenya at KNH (Waititu et al., 2016) the mean adherence rate over a period of one month was 71.2 % while 27.9 % of the participants, were not adhering to their ART. This was based on the MSH-TOOL (The Management Sciences for Health tool for antiretroviral drugs dispensing -MSHARV) In the same study the average mean adherence rate over a period of 3 months was observed to be 76.3 %, while 22.4 % were found to be non-adherent. This indicates that adherence to ART improved after using antiretroviral drugs for three months compared with those who used the drugs over a period of one month.

In Ukraine based on the case index, among the antenatal women 14% had a CASE score \leq 11 which was indicative of non-adherence. In the same study 35% of the participants reported missing \geq 1 dose (Bailey et al., 2014). Adherence rate in Malawi among pregnant women living with HIV is reported to be at 73% (Haas et al., 2016), this was based on pharmacy reports. In 2011, Malawi implemented (Option B+) in HIV treatment to (MOH Malawi, 2014). This was slightly earlier than in Kenya.

2.4 Factors associated with non-adherence to ART during pregnancy

According to several researcher's Non-adherence to ART is multi-factorial. (Byakika et al., 2005 ; Ilyasu et al, 2011). These include, health care systems factors or patient related factors such as socio-economic factors. Studies have also cited depression as a cause of non-adherence. According to Matsui (2011), compliance with therapy is highly dependent on many factors. These factors involve patient factors, family related factors, and regimen factors.

Pregnancy presents a unique challenge because in addition to maternal wellbeing, fetal health must also be factored in (Matsui, 2011). Findings from studies have demonstrated a higher rate of compliance to ART during pregnancy than during the non-pregnant state, (Mellins et al., 2008), although the adherence rate in pregnancy still not optimal. Better compliance in pregnancy has been associated with concern for baby's health, (Bardeguéz et al., 2008).

Similar to other findings, (Donenberg, 2005) cited, regimen complexity, patients age having advanced HIV disease, experiencing drug side effects; and patients' mental health as the factors that influence adherence among patients with HIV. Other studies have cited lack of knowledge on the implications of having a chronic disease, depression, and also cultural issues. (Murray et al., 2009).

In Nairobi Main barriers of adherence were being busy and forgetting (Samwel et al., 2011). Other reasons reported for missing therapy were difficulty accessing ART clinic and difficulty with dosing schedule.

Bailey et al, (2014) associated unplanned pregnancy versus planned pregnancy with missing therapy and living with extended family versus living with partner alone with missing therapy. Waititu et al, (2011) in Nairobi reported that 80% of patients interviewed had disclosed their HIV status; similarly, 80% of them were living with their family. 79% of women reported that they did receive social support and were also more adherent. In this study marital status did not predict adherence to ART.

Waititu et al, (2011) found out that the participants who regarded adherence to ART as important in the treatment of HIV were more adherent. This knowledge was translated into a positive belief in the benefit of ART therefore better compliance. (Waititu et al., 2011). Findings from the same study also indicated that proximity to the health facility where the where the patient refilled their ART medication predicted adherence. Respondents who lived within a walking distance from the health facility where they refill their medication were more adherent compared to those who went far away to refill their medication.

Waititu et al., (2016) in Nairobi KNH found out that participants who were employed were more adherent compared to those who were unemployed. In this study, there was a significant association between the age category and the mean adherence rate, with patients in the age group of 21-50 being more adherent. It is therefore believed that individuals do not generally exhibit uniformity in health-related matters but rather they have their reason to adhere or not to adhere to particular regimen.

2.5 Perinatal depression and adherence to HIV medication

Globally, it has been noted psychiatric disorders and in particular depression interferes with optimal compliance with ART (Mayston, 2012). In general, it has also been noted that people living with HIV are prone to psychological disturbances such as depression. This is due to HIV itself and perceptions regarding HIV in their environment (NASCO, 2016).

Depression has been reported to be a significant contributor to noncompliance with ART and consequently a contributor to treatment failure. Even subclinical levels of symptoms of depression have been shown to interfere with adherence to ART (Gonzales et al., 2011). This has been known increases the chances of ART treatment failure, also the development of ART resistance. This then increases the risk of vertical transmission of HIV/AIDS from mother to child (Cohen et al., 2011). The health of developing fetus or a new born might therefore be jeopardized.

Ante natal depression has a negative impact on maternal and child health outcomes particularly in HIV (Tamsen, 2012). Studies have shown that in HIV antenatal depression interferes with effective HIV management through its association with poor adherence to ART (Rao et al., 2010). In this study it was found that depression mediated the relationship between HIV-related stigma and compliance with HIV medication. Stigma was associated with severe depressive symptoms and this was in turn associated with poor adherence to Anti-retroviral therapy.

Rao et al suggested a specific mechanism by which depressive symptoms may affect adherence. Depression will aggravate levels of fatigue. There will be reduced ability to concentrate; or feeling worthless. These factors are said to be interfere with optimal adherence as it is necessary for an individual to have good concentration in order to remember when and even how to take medication.

In general depression in pregnancy has been associated with reduced uptake of ante natal care services. This has had adverse fetal and maternal outcomes (Lacaster et al., 2010; Adler et al., 2007; Crote et al., 2010). During pregnancy there is generally increased contact with health care; this should therefore provide an opportunity to screen for

depression, and treat, (Tamsen, 2012). Antenatal depression however remains undetected and untreated in low resource settings where early screening and treatment options might be not available (Goodman, 2010).

Tamsen et al. (2012) concluded that failure to detect ante natal depression has far reaching consequences. This includes a variety of implications chiefly the; missed opportunity to treat and to prevent postnatal depression which has been known to result in negative effect on the children.

Recent studies in Sub-Saharan Africa have suggested that receipt of ART, is associated with lower depressive symptoms (Okeke et al., 2013). This is through physiological, psychological, and stigma reduction pathways (Martinez et al., 2014). On the other hand, it is not known the extent to which ART affect depression across the perinatal periods. Kaida et al, (2014) associated increasing time on ART medication and viral suppression with lower depressive symptoms. In this study prevalence of depression was observed to be higher at the period of ART initiation.

Knowing the rates of adherence to ART medication and the prevalence of depressive symptoms during pregnancy is key. As the world gears towards elimination of transmission of HIV from mother to child; it is imperative to understand the relationship between depression during pregnancy and non-adherence to ART medication. This will optimize maternal and perinatal health outcomes.

Although findings from studies demonstrate a significant mental health benefits in the treatment of HIV using ART (Patel et al., 2012), ART alone will not treat mental illness among the pregnant women living with HIV. This study hopes to make a small contribution in the direction of providing estimates and nature of barriers to care in HIV positive women experiencing depression.

2.6 Theoretical model of depression

Cognitive behavioral therapists integrate mental events into behavioral frame work. This is based on the idea that thoughts, emotions and behavior interact. Aron Beck explains depressive symptoms to be the result of dysfunctional schemas such feeling inadequate

perceiving the future is hopeless. Therefore, depression comes as a result of maladaptive way of thinking. Physical and emotional symptoms are consequences of maladaptive thoughts. These three are described as the negative triad

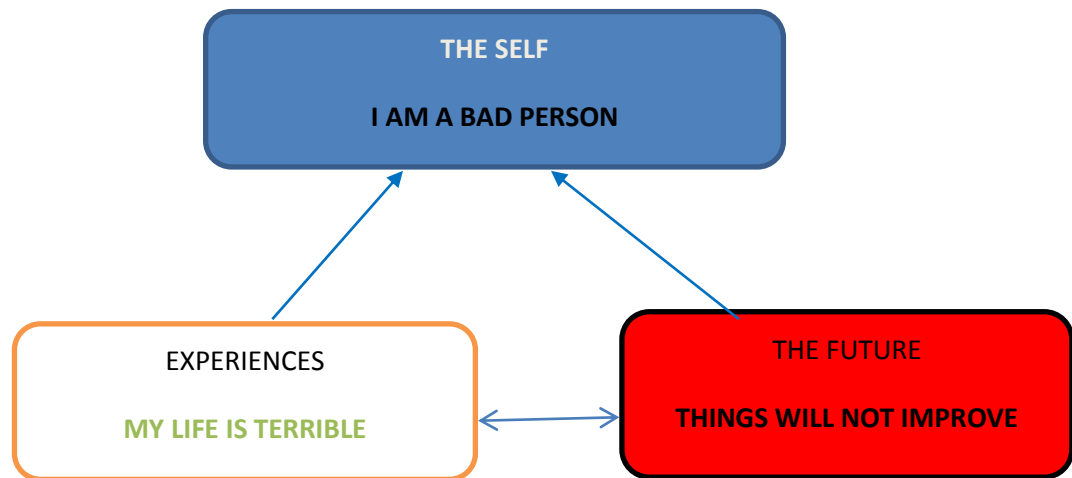


Figure 2.1: Theoretical Model of Depression

Because of core negative beliefs, secondary symptoms of depression arise for example because of hopelessness; the person will lose interest in daily activity. These assumptions shape the conscious cognitions. The HIV positive pregnant mother will therefore assume that their life has no meaning; the world is not just or fair. They will have negative thoughts about their future because of having a chronic illness and being on lifelong medication.

In the context of a HIV positive pregnant woman, diagnosis of HIV/AIDS is viewed as a personal failure, and that HIV is a chronic disease, they will die of it hence it is viewed as a hopeless situation to be on ART, which is a lifelong medication. These beliefs will shape what the individuals will pay his/her attention to. This selective attention is to their negative expectations. The unconscious maneuvers will help maintain the core negative schemas and help them remain feeling hopeless about the future.

CHAPTER 3: STUDY DESIGN AND METHODOLOGY

3.1 Study design

This was a hospital based cross-sectional study which was carried out at Kibera South Health Centre Nairobi to assess the prevalence of depression, inquire about the social support and barriers to care experienced by pregnant women living with HIV. Data on adherence to Anti-retroviral therapy was taken using the CASE adherence index.

3.1.1 Study area description

The study took place at Kibera South Health Centre. This is a health Centre that is located within Kibera slum, Nairobi, Kenya. Kibera slum is the biggest slum in Africa and is also considered to be one of the biggest in the world. It has approximately 2.5 million slum dwellers. This represent about more than half the population of Nairobi occupying just 6% of the land (APHRC, 2014; Nairobi cross-sectional Slums Survey, 2012).

Housing in this area is made of mud walls, roofing is done with corrugated tins. Some have concrete floors of average size 12ft x 12ft. These houses cost averagely KES 700 per Month. Up to 50% of the slum dwellers work in industrial area Nairobi. This is commonly unskilled jobs; However, unemployment rate is still high.

The facility serves residents of Kibera slum; this is therefore typically a low resource clientele. The clinic is part of a project run by a non-governmental organization-MSF Belgium in conjunction with the county government of Nairobi. The health center constitutes of an outpatient department, maternal child health clinic (MCH) and an in-patient maternity. In the outpatient department, patients with chronic diseases are followed up and other minor ailments are also handled.

The MCH clinic of KSHC provides ANC services, immunization, family planning and PMTCT services. On average 650 pregnant women are attended to at the clinic monthly. On average mothers on follow up in the PMTCT program both ante-nataly and post-nataly are 250 per month and averagely 27 pregnant mothers are recruited to the PMTCT program monthly. Total ANC mothers receiving PMTCT services are averagely 70 per

month. 1200 Children are seen for immunization per month and 1500 under five treated for minor ailments per month. Staffing of the MCH clinic constitutes of, nurses, clinical officer, record officers and one nutritionist. Access to ART in Kibera slum is good evidenced by presence of AMREF Health Center, MSF Silanga clinic, Kibera south health Centre, and Mbagathi Level 3 Hospital.

3.2 Study population

Study participants were women visiting the Kibera South Health Centre, who have been registered at the MCH clinic. These participants were recruited from pregnant women living with HIV, both newly diagnosed (treatment naïve) and patients who had been on ART, prior to the current pregnancy. The participants had to have been on ART for at least one month preceding the study and had to be registered for care at KSHC. Those below the age of 18 years were not included in the study.

3.2.1 Inclusion criteria

The participant had to be pregnant, and living with HIV they also had to be on ART. The participants had to have been registered for follow up at KSHC and they had to have been on ART for a period of at least one month preceding the study.

3.2.2 Exclusion criteria

Mothers presenting with any obstetric emergency, for example per vaginal bleeding, or those in labor will not be included. Women who decline to give consent will also be excluded. Those below the age of 18 years will not participate in the study.

3.3 Sample size determination

The investigator opted for Cochran's sample size formula for cross-sectional studies. Prevalence of depression Was 48.7 % (Peltzer et al, 2016). At 95% confidence level, (the alpha at a value of 0.05 or 5%) and at 5% level of precision.

$$n=Z^2P(1-P)/d^2$$

Where: n= Minimum Sample size

z=is the standard normal distribution set at 1.96 which corresponds 95% confidence interval.

p= is the prevalence under investigation set at 48.7%.

d= is the degree of accuracy desired or error margin set at 5% or 0.05.

$$n=1.96^2 \times 0.487(1-0.487)/0.05^2$$

The population of pregnant women living with HIV attending clinic at KSHC is less than 10,000. Assuming that 200 pregnant women living with HIV attend clinic as per the three-month clinic records in the year 2017. Thus, adjustment will be necessary for a representative sample size to be achieved.

$$nf=n/1+ (n/N)$$

Where nf= The final sample size, when population is less than 10,000

n= The sample size population of 10,000 or more

N=The size of total population from which the sample size is drawn for the survey.

$$nf=383/1+ (383/200)$$

$$nf=132$$

Therefore, to take care of defaulters which may arise during the study, 10% was added to the sample size. Hence appropriate sample size =132+ (132x10/100)

$$nf=146$$

3.4 Sampling method

Purposive sampling was employed to focus on the population of interest that meets study characteristics. This will best enable the researcher to answer the research question. All the pregnant women living with HIV and were enrolled for care at Kibera South Health Centre that met the study characteristics had a chance to participate.

3.5 Recruitment and consenting procedures

All staff at MCH had been informed of the study. A detailed explanation of the study was given to all the MCH staff prior to the study. When the study commenced, the MCH triage nurse on duty was provided with a chart containing the inclusion and the exclusion criteria. Pregnant women living with HIV who met the study criteria were directed to the room where the researcher was seated. The researcher then gave a detailed explanation of the study to the participant and provided a written informed consent form which would give further detail of study (see Appendix A). This happened two weeks prior to data

collection. The eligible participants were also provided with instructions on how to contact or reach the researcher. At this point, the contact detail of the eligible participant was recorded and a day for data collection fixed. Approximately, 10 participants were scheduled for data collection per day. Data collection took 2 months. Response rate was 93%; 10 respondents opted out in the middle of the interview.

3.6 Data collection procedures

Depression was assessed administering the EPDS screen for depression. Data on adherence to ART was collected using the CASE Adherence Index. Socio-demographic data and factors associated with depression and non-adherence to ART was collected by administering a researcher designed questionnaire.

3.7 Data collection instruments

Data collection tools were administered to individual respondents by the researcher. The tools were both in English and Swahili.

3.7.1 Socio demographic questionnaire

A socio demographic questionnaire developed by the researcher was used to explore the following areas;

- i. Demographic variables
- ii. Pregnancy and HIV related decisions and experiences
- iii. Social support and any barriers to care experienced by pregnant women living with HIV.

3.7.1.1 HIV/AIDS Stigma Instrument-Negative self-perception (sub scale)

The instrument is used to measure 6 dimensions of the HIV related stigma namely; Negative self-perception, verbal abuse, health care neglect, workplace stigma, social isolation, fear of contagion, and total perceived stigma. Of interest to the researcher is negative self-perception which consists of 5 items. Responses are measured on a Likert scale which is 4-point. Scores were computed by taking the mean of the individual's responses. A higher mean score was indicative of greater perceived stigma.

The tool was developed in 3 phases; Data was collected from 5 African countries. Scale alpha reliabilities were examined Negative Self-Perception with 5 items, had a scale reliability ($\alpha=0.906$), (Holzemer et al., 2007)

3.7.2 Edinburgh Post-Partum Depression Scale (EPDS)

The EPDS was used to screen for depression among all the participants. The tool was developed in Scotland by John L. Cox al., (1987). The EPDS has ten items with each having four possible responses. It is self-administered; the patient responds by circling the response that is closest to how she has been feeling in the past seven days. Total score of 12 or greater is an indicator of possible depression (Cox et al., 1987).

Question number 10 on the EPDS addresses suicidal ideation. A patient who scores higher than zero (0) in this question requires immediate referral to a mental health professional for further assessment and management (Cox et al., 1987). It was administered in English and Swahili version (Kumar et al., 2014)

When validated among pregnant women, the reliability scores by trimester were .82, .83 and .84 (Bergink et al., 2011). A score of 13 and above is indicative of probable major depression and a score of 10 is indicative of probable minor depression (Matthey, Henshaw, Elliott, & Barnett

3.7.3 The Center for Adherence Support Evaluation (CASE) adherence index

CASE Adherence is a tool that was developed by the New York Academy of Medicine's (NYAM) Center for Adherence Support Evaluation (CASE). It is a simple measure of self-reported antiretroviral therapy (ART) adherence. The CASE Index consists of three adherence questions which are rated on a Likert scale; - The questions address three different aspects of ART adherence: difficulty taking ART medication on time, frequency of missed ART doses and time since most recent missed ART dose.

The tool is said to have a high degree of sensitivity and specificity with the Adult AIDS Clinical Trials Group (AACTG) 3-day self-report (concurrent validity) and is a better predictor of HIV RNA changes over time than 3-day self-report (Mannheimer et al., 2006).

Scores;

- >10 = good adherence
- ≤ 10 = poor adherence

A higher composite score signifies better adherence

3.8 Variables

3.8.1 Dependent variables

- Adherence to ART

3.8.2 Independent variables

- Depression

3.8.3 Associated factors

- Age
- Parity
- Level of education
- Social support
- Social economic status

3.8.4 Materials

- The EPDS 150 copies
- CASE Index tool 150 copies
- Researcher designed questionnaire 150 copies
- Consent explanation and consent form 150 copies
- Cabinet with lock and key
- Pencils, erasers and sharpeners.

3.9 Quality assurance procedures

The EPDS is a well-known and evaluated tool for screening postpartum depression that has demonstrated acceptable clinical utility as a tool for screening depression (Cox et al, 1987). It was originally validated among 84 women post-delivery in Edinburgh and Livingston. It has since then been validated in numerous countries, among them is the

United State. It has also been validated in several other languages. The EPDS was originally for use in the postpartum period only, but since then, numerous studies have validated its use even in the antenatal period. In a French study among pregnant women, the EPDS was able to correctly identify depressed patients in their third trimesters at a threshold of 11.5 (Sensitivity 0.80; Specificity 0.08) thus was validated among that population (Garcia et al., 2003).

The CASE Index, is a self-reported adherence to antiretroviral therapy (ART). It has been used in several studies and has demonstrated a strong association between the self-reported adherence and immunologic, virologic, and the clinical outcomes of HIV-infected individuals (Fischl et al., 2002). The CASE Index has also been strongly correlated with a subscale which was used in the Adult AIDS Clinical Trials Group (AACTG), (Chesney et al., 2000). In this trial it was more strongly associated with HIV outcomes; when predicting CD4 cell count, it performed as well as the three-day self-report.

To ensure quality data, careful development of the questionnaire was done by first carrying out a thorough examination of other previous studies, and having an ongoing review by experts. A pilot testing of the questionnaire was carried out. This was done on subjects who were not included in the sample. To ensure the case construct, face, and content validity.

Data collection was carried out by the researcher herself. Continuous reviewing of the data was carried out so as to minimize the errors that may occur in the process of collecting, recording, and analyzing data;

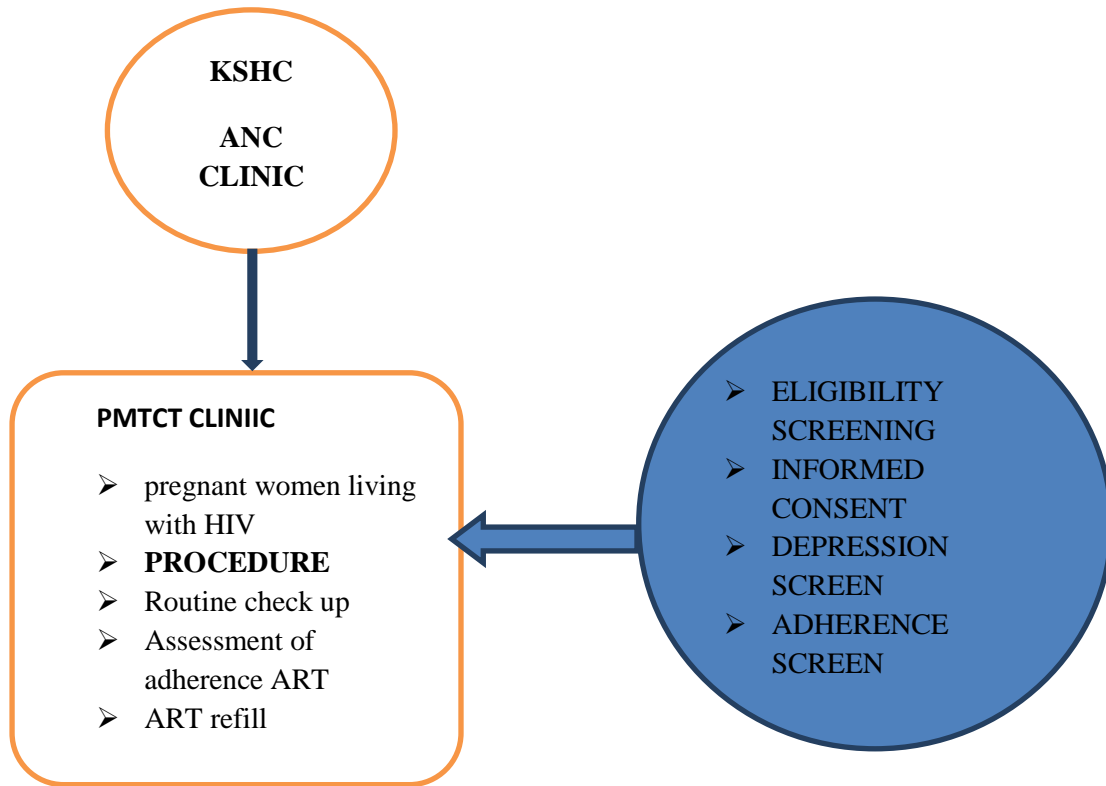


Figure 3.1: Flow chart

3.10 Ethical consideration

The research did not take place until approval from the University of Nairobi/Kenyatta national hospital research ethics committee. Clearance for the study to take place at KSHC was obtained from the Nairobi City County Health Operational Research Technical working group and MSF Belgium, Kenya mission. This study involved human subjects- pregnant women living with HIV, however the research did not include any invasive procedures that are harmful to participants, therefore no physical risk was involved, however ethical issues addressed will included: -

Recruitment procedure -All pregnant women living with HIV who met the eligibility criteria had an equal chance to participate in the study. Recruitment was voluntary. Participants were given information about the study and those who declined to be in the study did not suffer any consequences.

Informed consent- All the eligible participants were provided with an informed consent form two weeks prior to the date of data collection. The informed consent form included information telling the participants clearly about;

- i. Purpose of the study, and the data collection process.
- ii. Their right to decline to participate and the right to withdraw from the research even after the participation has begun.
- iii. Potential risks and benefits of participating in the study.
- iv. Issues of confidentiality and anonymity.
- v. Whom the participants can contact in case of any questions about the research.

All subjects included in the study gave a voluntary written informed consent prior to their inclusion. There was no coercion

Benefits- Participation in the study provided an opportunity of screening for depression at no cost. Scores from this test prompted appropriate referral and treatment. Early identification and management of depression and non-adherence to ART during pregnancy help improve maternal and child health outcomes.

The greatest benefit was also, being part of a team generating new knowledge which may help improve mental health care. This will directly benefit society

Risks- Participants were expected to respond to questions related to personal experiences, which were uncomfortable. To minimize this discomfort, the participants were assured of confidentiality and anonymity throughout the process.

The research took place in a hospital set up, where the researcher currently works. The mental health department has a psychologist, therefore for any psychological distress that arose, the researcher linked the participant with the psychologist in the mental health department for psychological support

Time commitment- Participation in this study involved responding to questions on a socio-demographic questionnaire and completion of screening tests for depression. This took approximately 30 minutes. To manage this, the participants were provided with an informed consent form two week prior so as to plan ahead.

Referral- The study took place in a hospital set up hence those who met criteria for clinical depression were issued with referral notes and taken to the department of mental health at the Kibera south Health Centre for treatment of depression and follow up.

The non-adherent women were also referred to the clinician in charge of Prevention of mother to child transmission of HIV at the MCH clinic of Kibera south health Centre for appropriate education and follow up.

Confidentiality and privacy- The participants were anonymous; serial numbers were used instead of names. Information obtained from the participants were filed and kept in a cabinet under lock and key, only accessed by the researcher.

Results- Only anonymized data will be published. Results will be shared with the University of Nairobi, the Nairobi City County Health Operational Research Technical working group and MSF- Belgium Kenya mission.

3.11 Data management

Data collected on the forms were stored in a separate lockable cabinet where only the researcher could access. Upon satisfactory review; Upon satisfactory review, data entry and data analysis were carried out using SPSS version 23. Exploratory and statistical data analysis was done and results were presented using tables. Descriptive statistics was employed to estimate the prevalence of depression (as measured by EPDS) and medication adherence (as measured by CAI) as well as the participant's characteristics. Mean prevalence rates and their respective 95%CI were estimated including subgroups.

Univariate associations of depression and adherence, socio-demographic, clinical characteristics were estimated using bivariate logistic regression to identify initial (crude) association. Variables with a P-value less than 0.05 were entered to generalized linear models using logit link to identify factors associated factors with depression and non-adherence after adjusting for potential confounders. Adjusted odds ratio with its 95% confidence interval was calculated to report the strength and significance of the association. All tests were two sided and statistical significance was declared at $P < 0.05$. All the data were analyzed using Statistical Package for the Social Sciences (SPSS window version 23, Chicago Illinois).

3.12 Use of the study

This study was undertaken in partial fulfillment of a Master of Science Degree in Clinical Psychology at the School of Health Science, University of Nairobi. Upon satisfactory completion results will be shared with the University of Nairobi, the Nairobi City County Health Operational Research Technical working group, MSF- Belgium Kenya mission and Kibera south health Centre. Findings will also be made available through publications in journals in the hope that it will contribute towards improvement of mental health services for pregnant women who are living with HIV

3.13 Role of investigator

The investigator carried out Proposal development; amendment and seeking approval from the KNH/UON Ethics and Research Board. Upon approval of the study, the investigator then implemented the study by Seeking consent and administration of the

study data collection tools. Upon completion, the researcher then analyzed data, interpreted, prepared report and give feedback to relevant institutions

3.14 Role of supervisors

The supervisors gave guidance and advice through the research process. These included proposal development, application and implementation of appropriate tools for measuring antenatal depression, and assessing adherence to ART, research methodology, data analysis and presentation of results.

3.16 Timeframe

Proposal development	4 Months	Jan 2017-june 2017
Ethical Approval	2 Months	June 2017-september 2017
Data collection	2 Months	October 2017-january 2018
Data analysis, report writing & Presentation of results	1 Month	February 2018- March 2018

CHAPTER 4: RESULTS

4.1 Introduction

This chapter entails analysis of the data that was collected for the study whose main objective was to establish whether there is a relationship between antenatal depression and non-adherence to ART among the pregnant women living with HIV, attending Kibera south Health centre-ante natal clinic. The findings of this analysis are reported as by study objectives and arranged in the following sections:

- i. Response Rate
- ii. Socio Demographic and clinical characteristics of Respondents
- iii. Negative Self perceived stigma
- iv. Prevalence of depression
- v. Sociodemographic factors associated with depression
- vi. Pregnancy and HIV related characteristics associated with depression
- vii. Multivariate analysis on predictors of depression.
- viii. ART adherence
- ix. Sociodemographic characteristics associated with ART adherence
- x. Pregnancy and HIV related characteristics associated with ART adherence
- xi. Multivariate analysis on predictors of good adherence.

4.2 Response rate

The sample size of population for the study was 146 respondents. The researcher managed to engage all 136 respondents in the study; therefore, the response rate was slightly above 93%. Ten respondents opted out in the middle of the interview.

4.2.1 Socio Demographic and clinical characteristics of respondents

Multiple factors influence adherence to ART among HIV patients, these factors could also serve as risk factors that mediates diagnosis of depression among pregnant women living with HIV. These factors include, age, level of education, income, HIV and pregnancy related concerns.

Majority of the respondents were between the age of 24 to 29 years, while minority of the respondents were between ages 36 to 42 years. Mean age of respondents was 28.9 years with a range of 18 to 42 years. Most of the respondents were married 91 (66.9%). Our study revealed that majority of the respondents 60 (44.1 %) had attained secondary school education while only 17(12.5 %) of the respondents had attained level of college/ tertiary education. In our study unskilled workers formed the majority 77 (59.2 %) with over 1/2 (63.2%) of all the respondents having an average income of less than 10,000 Kshs.

As pertaining pregnancy, majority of the respondents 52 (38.2%) had one living child, but slightly more than half of the respondents 71 (52.2%) had been pregnant more than 3 times. Nearly ¾ of the respondents (73%) reported that their pregnancy was unplanned and at the point of interview half of the respondents (50%) were in their third trimester.

As pertaining their HIV status, majority of the respondents 92 (67.6%) had disclosed their HIV status and at the same time, 95 (69.9%) reported having social support. In our study, we found out that 98 (72.1 %) of the respondents had prior knowledge of their HIV positive status before getting pregnant with 38 (27.9%) of them having learnt of their status during the current pregnancy. Half of the respondents 68 (50%) reported having a HIV positive spouse; while another 59(43.4%) reported not knowing the HIV status of their spouse. Majority of the respondents reported having undetectable viral load measures.

Our study revealed that 27 (19.9 %) of our participants experienced intimate partner violence. The following table presents a summary of sociodemographic profiles of the respondents, pregnancy and HIV related experiences.

Table 4.1: Respondents Socio-demographic Profiles (N=136)

Variable	Category	N(%)	Variable	Category	N(%)
Age	18 to 23yrs	29(21.3%)	Trimester	First Trimester	20(14.8%)
	24 to 29yrs	49(36.0%)		Second Trimester	47(34.8%)
	30 to 35yrs	33(24.3%)		Third Trimester	68(50.4%)
	36 to 42yrs	25(18.4%)		<i>Missing</i>	<i>1</i>
Age	Mean; median; range	28.9; 28.5; 18-42	Disclosed Status	Yes	92(67.6%)
Marital status	Single	23(16.9%)		No	44(32.4%)
	Married	91(66.9%)	Someone who is a real source of comfort	Yes	95(69.9%)
	Cohabiting	22(16.2%)		No	41(30.1%)
Education level	Primary School	59(43.4%)	Experience IPV	Yes	27(19.9%)
	Secondary School	60(44.1%)		No	109(80.1%)
	College/University	17(12.5%)	HIV status before Pregnancy	Yes	98(72.1%)
Occupation	Unemployed	25(19.2%)		No	38(27.9%)
	Self-employed	28(21.5%)	HIV status (Spouse)	Yes	68(50.0%)
	Casual	77(59.2%)		No	9(6.6%)
	<i>Missing</i>	<i>6(%)</i>		Not Known	59(43.4%)
Income	<5000	46(33.8%)	Any other lifelong meds apart from ART	Yes	11(8.1%)
	5001 to 10000	40(29.4%)		No	125(91.9%)
	10001 to 15000	25(18.4%)	Taking multivitamin or any other supplementation	Yes	95(70.9%)
	15001 and Above	25(18.4%)		No	39(29.1%)
No. of children	None	32(23.5%)	Viral load	<i>Missing</i>	<i>2</i>
	One	52(38.2%)		Detectable Copies	16(11.9%)
	Two	24(17.6%)		Undetectable Copies	87(64.9%)
	3 and above	28(20.6%)		Not Done	31(23.1%)
No. of Pregnancies	One	24(17.6%)		<i>Missing</i>	<i>2</i>
	Two	41(30.1%)	Reason for coming to the Clinic	Routine	103(77.4%)
	3 and above	71(52.2%)		Appointment	30(22.6%)
Pregnancy Planned	Yes	37(27.2%)		<i>Missing</i>	<i>3</i>
	No	99(72.8%)	Bread winner	Yes	25(18.5)
How did it make you feel that you were Pregnant	Very Happy	31(22.8%)		No	110(81.5)
	Happy	58(42.6%)		<i>Missing</i>	<i>1</i>
	Little Happy	16(11.8%)			
	Sad	21(15.4%)			
	Very sad	10(7.4%)			

4.3 Negative self-perceived stigma

On the negative self-perceived stigma scale the majority of respondents 107 (77.8%) indicated that they had felt ashamed of having the disease on the other hand nearly ¾ of the respondents (74.3%) reported that ‘they had never felt that they are no longer a person’. Overall mean stigma score was 0.6 ($SD=0.69 \pm 0.60$).

Refer to table 4.2 on scores of negative self-perceived stigma.

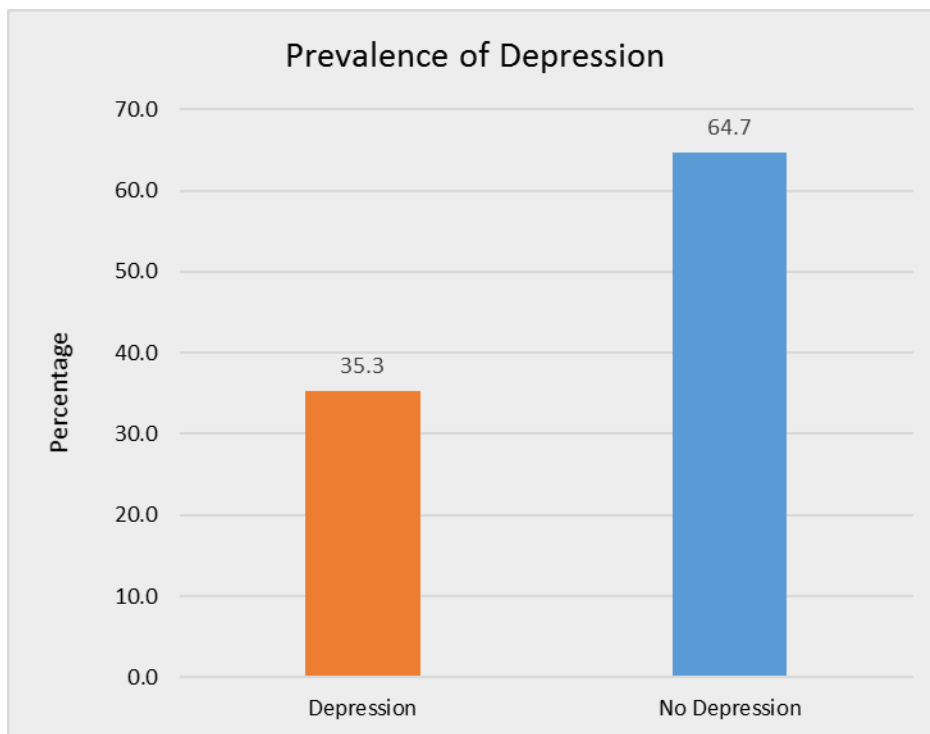
Table 4.2: Negative self-perceived stigma

Negative Self Perceived Stigma questions	Never n(%)	Once or Twice n(%)	Severally n(%)	Mostly n(%)	Mean±SD; Median
1. I felt I didn't deserve to live	76(55.9%)	45(33.1%)	14(10.3%)	1(0.7%)	0.56±0.71; 0.0
2. I felt ashamed of having the disease	29(21.3%)	64(47.1%)	31(22.8%)	12(8.8%)	1.19±0.87; 1.0
3. I felt completely Worthless	94(69.1%)	24(17.6%)	17(12.5%)	1(0.7%)	0.45±0.74; 0.0
4. I felt that I brought a lot of trouble to my family	56(41.2%)	50(36.8%)	23(16.9%)	7(5.1%)	0.86±0.88; 1.0
5. I felt that I am no longer a person	101(74.3%)	19(14.0%)	15(11.0%)	1(0.7%)	0.38±0.71; 0.0
Overall Score	-	-	-	-	0.69±0.60; 0.6

4.4 Prevalence of depression

EPDS scores of ≥ 10 is indicative of depressive symptoms at a level corresponding to an increased risk of minor or major depression. Therefore, this prevalence is based on the dichotomization of the above scores into Depression or No depression categories. As illustrated in Figure 4.1 below, it was established that 35.3% (95% C.I 27.2-44.1) of the respondents were suffering from minor to major depression, while had no depression

Figure 4.1: Prevalence of depression



4.5 Sociodemographic factors associated with depression

In our findings, young age was more associated with depression (18 to 23 years), (O.R 10.39; $p=0.001$), however there was no significant difference found between age 30 to 35 years and 36 to 43 years. The odds of getting depression was five times more among those who had secondary school level of education as compared to those who had tertiary / university education.

Our study also revealed that having lower income was a risk of getting depression with those earning between Kshs 5,000-10,000 being 4 times more likely to suffer from depression as compared to those earning Kshs 15,000 and above.

Table 4.3: Socio-demographic factors associated with depression

Variable	Category	Overall (N=136)	Depression		O.R.(95% C.I)	P-value
			No (n=88)	Yes (n=48)		
Age	18 to 23yrs	29(21.3%)	12(41.4%)	17(58.6%)	10.39(2.52-42.75)	0.001
	24 to 29yrs	49(36.0%)	30(61.2%)	19(38.8%)	4.64(1.22-17.67)	0.024
	30 to 35yrs	33(24.3%)	24(72.7%)	9(27.3%)	2.75(0.66-11.48)	0.165
	36 to 42yrs	25(18.4%)	22(88.0%)	3(12.0%)	Ref.	
Age	Mean±SD	28.9±6.1	30.3±6.0	26.3±5.6	4.02(1.94-6.09)	<0.0001
Marital status	Single	23(16.9%)	10(43.5%)	13(56.5%)	2.27(0.69-7.54)	0.179
	Married	91(66.9%)	64(70.3%)	27(29.7%)	0.74(0.28-1.96)	0.543
	Cohabiting	22(16.2%)	14(63.6%)	8(36.4%)	Ref.	
Education level	Primary School	59(43.4%)	37(62.7%)	22(37.3%)	4.46(0.93-21.37)	0.061
	Secondary School	60(44.1%)	36(60.0%)	24(40.0%)	5.00(1.05-23.87)	0.044
	College/University	17(12.5%)	15(88.2%)	2(11.8%)	Ref.	
Occupation	Unemployed	25(19.2%)	10(40.0%)	15(60.0%)	3.12(1.23-7.92)	0.017
	Self-employed	28(21.5%)	22(78.6%)	6(21.4%)	0.57(0.20-1.57)	0.276
	Casual	77(59.2%)	52(67.5%)	25(32.5%)	Ref.	
Income	<5000	46(33.8%)	27(58.7%)	19(41.3%)	2.81(0.90-8.82)	0.076
	5001 to 10000	40(29.4%)	21(52.5%)	19(47.5%)	3.62(1.13-11.54)	0.030
	10001 to 15000	25(18.4%)	20(80.0%)	5(20.0%)	1.00(0.25-4.00)	1.000
	15001 and Above	25(18.4%)	20(80.0%)	5(20.0%)	Ref.	
No. of children	None	32(23.5%)	18(56.3%)	14(43.8%)	1.94(0.66-5.71)	0.226
	One	52(38.2%)	32(61.5%)	20(38.5%)	1.56(0.58-4.21)	0.378
	Two	24(17.6%)	18(75.0%)	6(25.0%)	0.83(0.24-2.87)	0.772
	3 and above	28(20.6%)	20(71.4%)	8(28.6%)	Ref.	
No. of Pregnancies	One	24(17.6%)	10(41.7%)	14(58.3%)	3.12(1.20-8.10)	0.020
	Two	41(30.1%)	29(70.7%)	12(29.3%)	0.92(0.40-2.13)	0.849
	3 and above	71(52.2%)	49(69.0%)	22(31.0%)	Ref.	
Pregnancy Planned	Yes	37(27.2%)	30(81.1%)	7(18.9%)	0.33(0.13-0.82)	0.018
	No	99(72.8%)	58(58.6%)	41(41.4%)	Ref.	
Bread winner	Yes	25(18.5)	17(68.0%)	8(32.0%)	0.82(0.33-2.08)	0.681
	No	110(81.5)	70(63.6%)	40(36.4%)	Ref.	

4.6 Pregnancy, HIV related characteristics and other factors associated with depression

Being pregnant for the first time was associated with a higher likelihood of getting depression compared to those who had been pregnant more than 3 times (OR=3.12, 95% CI (1.20-8.10) ;($p=0.020$). The odds of getting depression was lower among participants who had planned their pregnancy OR=0.33, 95% CI (0.13-0.82); ($p=0.018$) as compared to those who had unplanned pregnancy.

Having disclosed HIV status was found to be protective against depression OR=0.70, 95% CI (0.33-1.47), at the same time, having social support was protective against depression OR=0.33,95% CI (0.15/0.70). Those participants who experienced Intimate partner violence had a significant risk of developing depressive symptoms OR=5.27,95% CI (2.13-13.00), as compared to the participants who did not experience intimate partner violence.

Our study found out that participants who knew of their HIV positive status before to pregnancy were less likely to be depressed OR=0.22, 95% CI (0.10-0.9) at the same time knowing HIV status of spouse was protective against depression OR=0.32, 95% CI (0.15-0.68). Our study also revealed that the participants who had undetectable viral loads were less likely to be depressed. We found out that good adherence was also protective against depression OR=0.11, 95% CI (0.05-0.28).

A significant difference was recorded between negative self-perceived stigma scores and depression; participants with no depression had lower mean score of the negative self-perceived stigma scale (Mean SD=0.5± 0.4) as compared to those with depression (Mean SD 1.1 ±0.6).

Table 4.4: Pregnancy, HIV related characteristics and other factors associated with depression

Variable	Category	Overall (N=136)	Depression		O.R(95% C.I)	P- value
			No (n=88)	Yes (n=48)		
How did it make you feel that you were Pregnant	Very Happy	31(22.8%)	26(83.9%)	5(16.1%)	0.05(0.01-0.30)	0.001
	Happy	58(42.6%)	36(62.1%)	22(37.9%)	0.15(0.03-0.79)	0.025
	Little Happy	16(11.8%)	12(75.0%)	4(25.0%)	0.08(0.01-0.57)	0.011
	Sad	21(15.4%)	12(57.1%)	9(42.9%)	0.19(0.03-1.11)	0.064
	Very sad	10(7.4%)	2(20.0%)	8(80.0%)	Ref.	
Trimester	First Trimester	20(14.8%)	14(70.0%)	6(30.0%)	0.65(0.22-1.90)	0.433
	Second Trimester	47(34.8%)	33(70.2%)	14(29.8%)	0.64(0.29-1.42)	0.276
	Third Trimester	68(50.4%)	41(60.3%)	27(39.7%)	Ref.	
Disclosed Status	Yes	92(67.6%)	62(67.4%)	30(32.6%)	0.70(0.33-1.47)	0.344
	No	44(32.4%)	26(59.1%)	18(40.9%)	Ref.	
Someone who is a real source of comfort	Yes	95(69.9%)	69(72.6%)	26(27.4%)	0.33(0.15-0.70)	0.004
	No	41(30.1%)	19(46.3%)	22(53.7%)	Ref.	
Experience IPV	Yes	27(19.9%)	9(33.3%)	18(66.7%)	5.27(2.13-13.00)	<0.0001
	No	109(80.1%)	79(72.5%)	30(27.5%)	Ref.	
HIV status before Pregnancy	Yes	98(72.1%)	73(74.5%)	25(25.5%)	0.22(0.10-0.49)	<0.0001
	No	38(27.9%)	15(39.5%)	23(60.5%)	Ref.	
HIV status Spouse	Yes	68(50.0%)	51(75.0%)	17(25.0%)	0.32(0.15-0.68)	0.003
	No	9(6.6%)	8(88.9%)	1(11.1%)	0.12(0.01-1.03)	0.053
	Not Known	59(43.4%)	29(49.2%)	30(50.8%)	Ref.	
Any other lifelong meds apart from ART	Yes	11(8.1%)	7(63.6%)	4(36.4%)	1.05(0.29-3.79)	0.938
	No	125(91.9%)	81(64.8%)	44(35.2%)	Ref.	
Multivitamin or any other supplementation	Yes	95(70.9%)	61(64.2%)	34(35.8%)	1.25(0.56-2.79)	0.579
	No	39(29.1%)	27(69.2%)	12(30.8%)	Ref.	
Viral load	Detectable	16(11.9%)	6(37.5%)	10(62.5%)	1.20(0.35-4.15)	0.769
	Undetectable	87(64.9%)	68(78.2%)	19(21.8%)	0.20(0.08-0.48)	<0.0001
	Not Done	31(23.1%)	13(41.9%)	18(58.1%)	Ref.	
Reason for coming to the Clinic	Routine	103(77.4%)	70(68.0%)	33(32.0%)	0.62(0.27-1.42)	0.255
	Appointment	30(22.6%)	17(56.7%)	13(43.3%)	Ref.	
Adherence	Good Adherence	103(75.7)	79(76.7%)	24(23.3%)	0.11(0.05-0.28)	<0.0001
	Poor Adherence	33(24.3)	9(27.3%)	24(72.7%)	Ref.	
Negative self-stigma	Mean±SD	0.7±0.6	0.5±0.4	1.1±0.6	-0.66(-0.86 to-0.45)	<0.0001

4.7 Multivariate analysis of depression

After adjusting for all significant variables at the bivariate level

Age: 24 to 29 years were about 20 times more likely to suffer from depression as compared to the participants from the other age group (36 to 42 years) A.O.R 20.9 (95% CI 0.38-158.68). No significant difference was found between ages 18 to 23 years, 30 to 35 years, and 36 to 42 years.

Income: Those with average monthly income of Kshs 5001- 10,000 were 16 times more likely to have depression as compared to those above Kshs 10,000 A.O.R 16.12 (95% CI 1.36-190.86)

Intimate Partner Violence: Those who responded “Yes” to the experienced Intimate partner violence were 17 times likely to suffer from depression as compared to the participants who did not experience intimate partner violence A.O.R 16.93(95% CI 2.33-123.03)

Adherence: Being adherent was protective against depression AOR 0.05 (95% CI 0.01-0.34) as compared to being non-adherent

Negative self-perceived stigma: higher levels of stigma was associated with depression A.O.R 14.54 (95% CI 2.63- 80.45)

Table 4.5: Multivariate analysis (Predictors of depression)

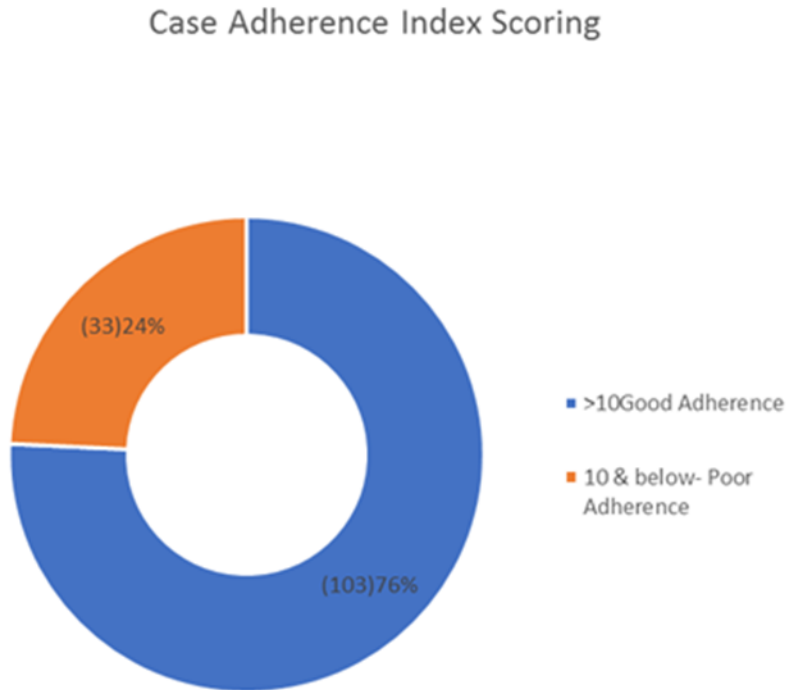
Variable	Category	β (s.e)	A.O.R(95% C.I)	P-value
Age	18 to 23yrs	2.05(1.54)	7.75(0.38-158.68)	0.1839
	24 to 29yrs	3.04(1.34)	20.88(1.51-288.92)	0.0234
	30 to 35yrs	1.83(1.28)	6.26(0.51-76.96)	0.1518
	36 to 42yrs	Ref.	1	
Education level	Primary School	-0.56(1.59)	0.57(0.03-12.81)	0.7225
	Secondary School	0.21(1.54)	1.23(0.06-25.33)	0.8935
	College/University	Ref.	1	
Occupation	Unemployed	0.20(1.08)	1.22(0.15-10.14)	0.8515
	Self-employed	0.60(0.95)	1.81(0.28-11.73)	0.5321
	Casual	Ref.	1	
Income	<5000	1.23(1.29)	3.43(0.27-43.01)	0.3395
	5001 to 10000	2.78(1.26)	16.12(1.36-190.86)	0.0274
	10001 to 15000	-0.25(1.28)	0.78(0.06-9.53)	0.8443
	15001 and Above	Ref.	1	
No. of Pregnancies	One	0.44(1.36)	1.55(0.11-22.13)	0.7484
	Two	-0.95(1.01)	0.39(0.05-2.77)	0.3434
	3 and above	Ref.	1	
Pregnancy Planned	Yes	-2.05(1.31)	0.13(0.01-1.67)	0.1173
	No	Ref.	1	
How did it make you feel that you were Pregnant	Very Happy	0.07(2.04)	1.07(0.02-58.87)	0.9718
	Happy	-1.68(1.75)	0.19(0.01-5.75)	0.3367
	Little Happy	-3.53(1.79)	0.03(0.00-0.97)	0.0481
	Sad	-0.96(1.64)	0.38(0.02-9.47)	0.5571
	Very sad	Ref.	1	
Someone who is a real source of comfort	Yes	0.00(0.80)	1.00(0.21-4.83)	0.9988
	No	Ref.	1	
Experience IPV	Yes	2.83(1.01)	16.93(2.33-123.03)	0.0052
	No	Ref.	1	
HIV status before Pregnancy	Yes	0.03(1.16)	1.03(0.11-10.01)	0.9764
	No	Ref.	1	
HIV status (Spouse)	Yes	0.60(0.93)	1.82(0.29-11.26)	0.5195
	No	-2.43(2.01)	0.09(0.00-4.55)	0.2273
	Not Known	Ref.	1	
Viral load	Detectable Copies	-0.21(1.39)	0.81(0.05-12.44)	0.8814
	Undetectable Copies	-1.07(1.02)	0.34(0.05-2.51)	0.2909
	Not Done	Ref.	1	
Adherence	Good Adherence	-3.01(0.99)	0.05(0.01-0.34)	0.0023
	Poor Adherence	Ref.	1	
Negative self-stigma	-	2.68(0.87)	14.54(2.63-80.45)	0.0022

Note: β -Beta coefficient; s.e-standard error; AOR-Adjusted odds ratio; Ref-Reference category

4.8 ART medication adherence

As illustrated in Figure 4.2 below, majority of the respondents 75.7% (95% C.I 68.4-82.4) were adhering to their medication. the remaining percentage (24.3%) had poor adherence

Figure 4.2: Case adherence index scoring



4.9 Socio-demographic factors associated with non-adherence

Young age was significantly associated with non-adherence, with those of between ages 18 to 23 years being 6 times more likely to be non-adherent. OR= 6.84,95% CI (1.67-28.01). Our study revealed that being unemployed was protective against non-adherence OR=0.91, 95% CI (0.34-2.48), also being self-employed was protective against non-adherence OR=0.18, 95% CI (0.04-0.82).

Table 4.6: Socio-demographic factors associated with adherence

Variable	Category	Overall (N=136)	Adherence		O.R(95%C.I)	P-value
			Good (n=103)	Poor (n=33)		
Age	18 to 23yrs	29(21.3%)	15(51.7%)	14(48.3%)	6.84(1.67-28.01)	0.007
	24 to 29yrs	49(36.0%)	39(79.6%)	10(20.4%)	1.88(0.47-7.56)	0.374
	30 to 35yrs	33(24.3%)	27(81.8%)	6(18.2%)	1.63(0.37-7.27)	0.522
	36 to 42yrs	25(18.4%)	22(88.0%)	3(12.0%)	Ref.	
Age	Mean±SD	28.9±6.1	29.8±5.9	26.1±1.1	3.73(1.37-6.08)	0.002
Marital status	Single	23(16.9%)	14(60.9%)	9(39.1%)	1.13(0.34-3.76)	0.848
	Married	91(66.9%)	75(82.4%)	16(17.6%)	0.37(0.13-1.04)	0.059
	Cohabiting	22(16.2%)	14(63.6%)	8(36.4%)	Ref.	
Education level	Primary School	59(43.4%)	41(69.5%)	18(30.5%)	3.29(0.68-15.92)	0.138
	Secondary School	60(44.1%)	47(78.3%)	13(21.7%)	2.07(0.42-10.26)	0.371
	College/University	17(12.5%)	15(88.2%)	2(11.8%)	Ref.	
Occupation	Unemployed	25(19.2%)	18(72.0%)	7(28.0%)	0.91(0.34-2.48)	0.859
	Self-employed	28(21.5%)	26(92.9%)	2(7.1%)	0.18(0.04-0.82)	0.027
	Casual	77(59.2%)	54(70.1%)	23(29.9%)	Ref.	
Income	<5000	46(33.8%)	34(73.9%)	12(26.1%)	1.85(0.53-6.50)	0.336
	5001 to 10000	40(29.4%)	28(70.0%)	12(30.0%)	2.25(0.63-7.97)	0.209
	10001 to 15000	25(18.4%)	20(80.0%)	5(20.0%)	1.31(0.31-5.60)	0.713
	15001 and Above	25(18.4%)	21(84.0%)	4(16.0%)	Ref.	
No. of children	None	32(23.5%)	21(65.6%)	11(34.4%)	2.41(0.72-8.09)	0.155
	One	52(38.2%)	40(76.9%)	12(23.1%)	1.38(0.43-4.41)	0.587
	Two	24(17.6%)	19(79.2%)	5(20.8%)	1.21(0.30-4.81)	0.786
	3 and above	28(20.6%)	23(82.1%)	5(17.9%)	Ref.	
No. of Pregnancies	One	24(17.6%)	14(58.3%)	10(41.7%)	2.91(1.07-7.91)	0.036
	Two	41(30.1%)	32(78.0%)	9(22.0%)	1.15(0.45-2.94)	0.778
	3 and above	71(52.2%)	57(80.3%)	14(19.7%)	Ref.	
Pregnancy Planned	Yes	37(27.2%)	32(86.5%)	5(13.5%)	0.40(0.14-1.12)	0.081
	No	99(72.8%)	71(71.7%)	28(28.3%)	Ref.	
Bread winner	Yes	25(18.5)	18(72.0%)	7(28.0%)	1.26(0.47-3.34)	0.647
	No	110(81.5)	84(76.4%)	26(23.6%)	Ref.	

4.10 Pregnancy, HIV related characteristics and other factors associated with non-adherence

According to our study, the participants who responded the current pregnancy was the first were 3 times more likely to be non-adherent as compared to those who had been pregnant more than 3 times OR=2.91 ,95% CI (1.07-7.91). Disclosure of HIV status was found to be protective to non-adherence OR=0.33, 95% CI (0.15-0.75) as compared to non-disclosure. Social support was found to be protective against non-adherence OR =0.33, 95% CI (0.15-0.75).

We found that prior knowledge of HIV status was protective against was protective against non-adherence OR=0.20, 95% CI (0.10-0.60) and having a spouse who is also living with HIV was found to be protective against non-adherence OR=0.24,95%CI (0.09-0.47). In our study we found that those with undetectable viral loads were less likely to be non-adherent OR=0.14, 95% CI (0.05-0.39).

Our study revealed that no depression was protective against non-adherence with OR= 0.11, 95%CI (0.05-0.28), and having low levels of stigma was associated with high levels of adherence ($p < 0.0001$).

Table 4.7 Pregnancy, HIV related characteristics and other factors associated with non-adherence

Variable	Category	Overall (N=136)	Adherence		O.R(95%C.I)	P- value
			Good (n=103)	Poor (n=33)		
How did it make you feel that you were Pregnant	Very Happy	31(22.8%)	29(93.5%)	2(6.5%)	0.05(0.01-0.31)	0.002
	Happy	58(42.6%)	41(70.7%)	17(29.3%)	0.28(0.07-1.11)	0.069
	Little Happy	16(11.8%)	12(75.0%)	4(25.0%)	0.22(0.04-1.21)	0.082
	Sad	21(15.4%)	17(81.0%)	4(19.0%)	0.16(0.03-0.83)	0.030
	Very sad	10(7.4%)	4(40.0%)	6(60.0%)	Ref.	
Trimester	First Trimester	20(14.8%)	14(70.0%)	6(30.0%)	1.11(0.37-3.30)	0.858
	Second Trimester	47(34.8%)	40(85.1%)	7(14.9%)	0.45(0.17-1.18)	0.105
	Third Trimester	68(50.4%)	49(72.1%)	19(27.9%)	Ref.	
Disclosed Status	Yes	92(67.6%)	76(82.6%)	16(17.4%)	0.33(0.15-0.75)	0.008
	No	44(32.4%)	27(61.4%)	17(38.6%)	Ref.	
Someone who is a real source of comfort	Yes	95(69.9%)	78(82.1%)	17(17.9%)	0.34(0.15-0.77)	0.010
	No	41(30.1%)	25(61.0%)	16(39.0%)	Ref.	
Experience IPV	Yes	27(19.9%)	20(74.1%)	7(25.9%)	1.12(0.42-2.94)	0.822
	No	109(80.1%)	83(76.1%)	26(23.9%)	Ref.	
HIV status before Pregnancy	Yes	98(72.1%)	83(84.7%)	15(15.3%)	0.20(0.09-0.47)	<0.0001
	No	38(27.9%)	20(52.6%)	18(47.4%)	Ref.	
HIV status (Spouse)	Yes	68(50.0%)	60(88.2%)	8(11.8%)	0.24(0.10-0.60)	0.002
	No	9(6.6%)	5(55.6%)	4(44.4%)	1.45(0.35-5.98)	0.609
	Not Known	59(43.4%)	38(64.4%)	21(35.6%)	Ref.	
Any other lifelong meds apart from ART	Yes	11(8.1%)	8(72.7%)	3(27.3%)	1.19(0.30-4.76)	0.808
	No	125(91.9%)	95(76.0%)	30(24.0%)	Ref.	
Multivitamin or any other supplementation	Yes	95(70.9%)	75(78.9%)	20(21.1%)	0.53(0.23-1.22)	0.137
	No	39(29.1%)	26(66.7%)	13(33.3%)	Ref.	
Viral load	Detectable	16(11.9%)	5(31.3%)	11(68.8%)	3.05(0.85-10.90)	0.087
	Undetectable	87(64.9%)	79(90.8%)	8(9.2%)	0.14(0.05-0.39)	<0.0001
	Not Done	31(23.1%)	18(58.1%)	13(41.9%)	Ref.	
Reason for coming to the Clinic	Routine	103(77.4%)	78(75.7%)	25(24.3%)	0.88(0.35-2.23)	0.789
	Appointment	30(22.6%)	22(73.3%)	8(26.7%)	Ref.	
Depression	No	88(64.7)	79(89.8%)	9(10.2%)	0.11(0.05-0.28)	<0.0001
	Yes	48(35.3)	24(50.0%)	24(50.0%)	Ref.	
Negative self-stigma	Mean±SD	0.7±0.6	0.6±0.53	1.1±0.7	-0.49(-0.71 to -0.27)	<0.0001

4.11 Multivariate analysis (Predictors of non-adherence)

After adjusting for all other factors that were significantly associated with non-adherence participants who were not depressed had significantly lower levels of non-adherence A.O.R 0.18($p=0.017$)

Table 4.8: Multivariate analysis (Predictors of non-adherence)

Variable	Category	β (s.e)	A.O.R(95% C.I)	P-value
Age	18 to 23yrs	0.99(1.21)	2.70(0.25-28.71)	0.411
	24 to 29yrs	-0.02(1.09)	0.98(0.12-8.33)	0.985
	30 to 35yrs	0.47(1.12)	1.59(0.18-14.31)	0.677
	36 to 42yrs	Ref.	1	
Occupation	Unemployed	-0.45(0.82)	0.64(0.13-3.17)	0.583
	Self-employed	-1.30(1.04)	0.27(0.04-2.09)	0.212
	Casual	Ref.	1	
No. of Pregnancies	One	-1.19(1.10)	0.30(0.04-2.64)	0.281
	Two	-0.57(0.77)	0.56(0.13-2.53)	0.453
	3 and above	Ref.	1	
Feeling upon learning of Pregnancy	Very Happy	-0.91(1.34)	0.40(0.03-5.63)	0.500
	Happy	-0.02(1.09)	0.98(0.12-8.26)	0.985
	Little Happy	-0.72(1.31)	0.48(0.04-6.35)	0.581
	Sad	-1.36(1.24)	0.26(0.02-2.89)	0.270
	Very sad	Ref.	1	
Disclosed Status	Yes	-0.04(0.73)	0.96(0.23-4.07)	0.961
	No	Ref.	1	
Someone who is a real source of comfort	Yes	-0.35(0.68)	0.71(0.19-2.68)	0.608
	No	Ref.	1	
HIV status before Pregnancy	Yes	-1.22(0.85)	0.30(0.06-1.57)	0.152
	No	Ref.	1	
HIV status (Spouse)	Yes	-0.43(0.92)	0.65(0.11-3.94)	0.638
	No	2.13(1.22)	8.40(0.76-92.52)	0.082
	Not Known	Ref.	1	
Viral load	Detectable Copies	1.29(0.89)	3.62(0.63-20.63)	0.148
	Undetectable Copies	-0.84(0.79)	0.43(0.09-2.04)	0.289
	Not Done	Ref.	1	
Depression	No	-1.74(0.73)	0.18(0.04-0.73)	0.017
	Yes	Ref.	1	
Negative self-stigma	Mean \pm SD	0.32(0.54)	1.37(0.48-3.96)	0.558

Note: β -Beta coefficient; s.e-standard error; AOR-Adjusted odds ratio; Ref-Reference category

CHAPTER 5: DISCUSSION

The mean age of the participants in the study was 28.9 years, with a range of 18-42 years; with majority of the respondents being between the age of 24 to 39 years, this could be a general picture of women in their reproductive age. Other studies that have focused women seeking PMTCT services have reported similar results. (Yator et al., 2016) reported that two thirds of the women attending PMTCT at KNH, Nairobi were aged 26-35 years.

Level of education in the slum areas remained low; with 43.4 % having a post of primary education. This could be the reason as to why more than half of the respondents (59.2%) were doing unskilled work. Subsequently; 86(63.2%) earned an income of less than Kshs10,000.00 thus demonstrating low socioeconomic status.

Despite the picture portraying economic constraints; slightly more than half of the respondents 71 (52.2 %) had been pregnant more than 3 times, with almost $\frac{3}{4}$ (72.8%) reporting unplanned pregnancies. This highlights a gap therefore a critical need of an inquiry and intervention into family planning practices.

Based on the scores on the negative self-perceived Stigma Scale; majority of the respondents 107 (77.8%) indicated that they had felt ashamed of having the disease this was noted to be the most stigmatizing item on the stigma scale. Nearly $\frac{3}{4}$ of the respondents (74.3%) reported that 'they had never felt that they are no longer a person'; this was noted to be the least stigmatizing item.

Overall mean stigma score was 0.6 ($SD=0.69 \pm 0.60$). Based on overall mean score of the stigma subscale, the population was less stigmatized. However, in the study population having low levels of stigma was associated with high levels of adherence ($p=<0.0001$). It was also noted that participants with no depression had lower mean score of the negative self-perceived stigma scale (Mean $SD=0.5 \pm 0.4$) as compared to those with depression (Mean $SD 1.1 \pm 0.6$). There is still a need to address negative self-perception. (Turan et al, 2014) in his findings reported that internalized stigma is a significant predictor of depression.

It is worrying to note that 35.3% of the respondents were suffering from minor to major depression. Similarly, (Kaida et al., 2014), in Uganda reported 39% prevalence rate. Higher prevalence rates (48.7%) have been reported in Mpumalanga province, South Africa; in a study that was done to establish the prevalence of prenatal depression among HIV infected women and associated factors (Peltzer, Rodriguez, & Jones, 2016).

Factors associated with depressive symptoms among pregnant women living with HIV were young age (18-23years), low income, experience of IPV, poor adherence and negative self-perceived stigma. Similarly, In South Africa being unemployed, having an unplanned pregnancy, and intimate partner violence were associated with depressive symptoms (Peltzer, Rodriguez, & Jones, 2016).

In general pregnancy and child birth bring many physical and psychological changes. Globally, adherence to ART during pregnancy (Nachege et al., 2012) was reported to be 73 %; close to these, findings from this study established that 75.7% of the participants had good adherence while 24.3% of the respondents had poor adherence. Among general population in Kenya (Waititu et al., 2016), in a cross-sectional study at KNH the mean adherence rate over a period of one month was 71.2 % while 27.9 % of the participants, were not adherent to ART medication. This was based on the MSH-TOOL (The Management Sciences for Health tool for antiretroviral drugs dispensing -MSHARV).

Employed status found to be risk factor for non-adherence, contrary to (Nachege et al., 2015), employed individuals in low- and high-income countries were likely to adhere to ART compared to unemployed. This could be attributed to nature of employment. In this study, the population majorly consisted of unskilled workers. Being busy could be the main obstacle. To maximize adherence among the unskilled workers; there is need to educate the workers on strategies such as use of alarms and carrying medication to the work place. Addressing negative self-perceived stigma would help the individuals be able to carry their medication wherever they go; and in turn take medication on time.

Self-employment and unemployment were a protective factor, this is potentially related to better structuring of the day & being in control of time. Bailey et al, (2014) associated living with extended family versus living with partner alone with missing therapy and unplanned pregnancy versus planned pregnancy with missing therapy and. In our study planned / unplanned pregnancy did not predict adherence. In our study; disclosure, HIV + spouse and social support were protective against non-adherence.

This study found an association between depression and non-adherence to ART medication. In a similar study among adult HIV infected patients (Waititu et al., 2016), Found a minimal relationship between depression and non-adherence to antiretroviral therapy. Nachega et al, (2016), in a meta-analysis also reported that post-partum depression may impact adherence

Finally; in this study the participants with undetectable viral loads were less likely to be depressed. This relates to the fact that pregnant women who were not depressed took their ART medication; therefore, achieving viral suppression.

5.1 Study limitations

- i. Our participants were recruited from a health Centre within a slum set up, the findings may not be replicated in urban setting.
- ii. The study relied on self-report of depression. This was not verified by a diagnostic interview, participants may therefore under or over report depression.
- iii. This was a cross-sectional study; causal inferences were not examined it is therefore thought that longitudinal analysis may provide additional insight into maternal depression.

5.2 Conclusion

As noted in the findings, the study clearly shows that HIV infected mothers bear the burden of depression as they go through their pregnancies. The prevalence rate reported in the study demonstrates the genesis of this conclusion. That said and noting the impact of depression on the general quality of life on any HIV infected individual, this is disconcerting as it is expected that the quality of life of the pregnant woman will be

worse as she deals with intricate issues concerning the fetus and more so concerns about prevention of transmission of HIV.

Disclosure of HIV status to sexual partners is crucial to the continuum of HIV. In our study, we noted that 92 (67.6%) of the respondents had disclosed their status, while 44(32.7%) had not disclosed their status. Alarmingly 59(43.4%) of the respondents did not know the HIV status of their spouse. This highlights the importance of new strategy in Kenya which is PNS (Partner notification service)

Finally, we found out that not depressed had significant lower levels of non-adherence. One main consequence of depression in HIV infection is the resulting non-adherence to medication. Negative self-perception was also related to depression and in turn non-adherence to medication. It is therefore concluded that mothers that felt negatively towards the self were primarily depressed and as a consequence were more likely to suffer from poor adherence to ART medication.

5.3 Recommendations

The study therefore recommends that:

1. Periodical assessment of mothers' psychological needs, need to be incorporated in the ANC routine checkup at the PMTCT clinics
2. Referrals to psychiatric evaluations should be considered in cases where mothers are found to be having Major depressive disorders
3. Continued psycho education on mental health issues in HIV should be done at the PMTCT clinic
4. Medication counselling for the mothers should be done on a regular basis
5. Most respondent had unplanned pregnancies and therefore family planning methods programs and also preventive methods for sexually transmitted infections including HIV should be focused on
6. Inclusion of peer support groups or group counselling could help the mothers manage particularly mild to moderate depression
7. Further studies should be done focusing on women in same trimester
8. Further research to investigate specific barriers to adherence ART medication

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APPENDICES

Appendix I: Informed Consent Form

STUDY TITLE: THE ASSOCIATION BETWEEN DEPRESSION AND NON-ADHERENCE TO ANTIRETROVIRAL THERAPY AMONG PREGNANT WOMEN LIVING WITH HIV

Dear participant,

My name is Joan Cherono Kogo, a Masters student in Clinical Psychology at the Department of Psychiatry, University of Nairobi. I am carrying out a scientific study on “The association between depression and non-adherence to antiretroviral therapy among pregnant women living with HIV”. The study forms a part of the requirements for the award of a Masters Degree. The study will be under the supervision of;

1. Dr. Manasi Kumar,
Senior Lecturer,
Department of Psychiatry- University of Nairobi.
2. Dr Caleb Othieno,
Associate Professor,
Department of Psychiatry-University of Nairobi.

I invite you to participate in the study. I intend to ask you a set of questions regarding your sociodemographic information; pregnancy and HIV related decisions and experiences. I also intend to conduct interviews to detect depression and to ask questions related to how you take your anti-retroviral drugs. If depression is diagnosed, I will refer you a mental health professional for care. If non-adherence is found I will refer you to the clinician for proper management.

At the end of the study, only anonymized data will be published. Results will be shared with the University of Nairobi, the Nairobi City County Health Operational Research Technical working group and MSF- Belgium Kenya mission.

Please note the following: -

1. Your participation is voluntary and that you have a right to stop being part of the research study at any time without any penalty
2. No harmful or invasive procedures shall be conducted on you.
3. You will receive no pay in cash in return for your participation in this study, however, Participation in this study involves completion of some standardized tests for depression. Scores from this test may hint a mental health problem which will further prompt appropriate referral and treatment.
4. The data we collect do not contain your name. To keep information about you confidential we will identify you by numbers so that no one will link the data you provided to the identifying information you supplied.

If you have questions about this study, or if you want to find out about the final results of this study you can contact the researcher;

Joan Cherono Kogo,
Telephone Number- +254 720 972 829
Email- joan.kogo2@gmail .com

Or the supervisors on;
Dr. Manasi Kumar,
P.O. BOX 19676-00202, NAIROBI
Tel: +254 717379687; Email: m.kumar@ucl.ac.uk

Or

Dr. Caleb J Othieno, MB, ChB, MMed (Psych)
Associate Professor, Department of Psychiatry (University of Nairobi)
P.O. BOX 19676-00202, NAIROBI
Tel: +254 733 255111; Email:cjothieno@gmail.com
For Further inquiries you can contact the;

Kenyatta National Hospital-University of Nairobi Ethics and Research committee through the chairperson of the Kenyatta National Hospital/University of Nairobi Ethics Committee through Telephone Number 2726300 Extension 44102

P.O. Box 20723,
NAIROBI

Appendix II: Consent Form

STUDY TITLE: THE ASSOCIATION BETWEEN DEPRESSION AND NON-ADHERENCE TO ANTIRETROVIRAL THERAPY AMONG PREGNANT WOMEN LIVING WITH HIV

Participant’s statement

I, the undersigned have read this consent form or had the information read to me. I have had my questions answered in a language that I understand. I do hereby give consent to participate in this study, whose nature and purpose have been fully explained to me by the researcher (Joan Kogo). I understand that all the information gathered will be treated with confidentiality and used for the purpose of this study and as a pilot study for an intervention project only.

Participants Name.....

Signature/thumb stamp of Participant

Date

Researcher’s statement

I, the undersigned, have fully explained the relevant details of this research study to the participant named above and believe that the participant has understood and has willingly and freely given his/her consent.

Researcher’s Name:.....

Date:

Signature

Appendix III: Swahili Version

ANDIKO: UHUSIANO KATI YA UNYNGOVU KWA MAMA MJAMZITO MWENYE VIRUSI VYA UKIMWI NA UZINGATIAJI WA MADAWA YA KUPUNGUZA MAKALI YA VIRUSI VYA UKIMWI

Kwa mshiriki,

Jina languni Joan Cheron Kogo, Mwanafunzi wa saikolojia ya kimatibabu katika chuo kikuu cha Nairobi, Shule ya madaktari, Idara ya Psychiatry. Ninafanya utafiti kuhusu “uhusiano kati ya unyngovu kwa mama mjamzito mwenye virusi vya ukimwi na uzingatiaji wa madawa ya kupunguza makali ya virusi vya ukimwi” Utafiti huu ni sehemu ya masomo yangu. Hii itakuwa chini ya usimamizi na uongozi wa;

1. Daktari Manasi Kumar,
Mhadhiri mkuu
Idara ya Psychiatry-Chuo kikuu cha Nairobi
2. Daktari Caleb Othieno
Profesa Mshiriki
Idara ya psychiatry-Chuo kikuu cha Nairobi

Ninakualika kushiriki katika utafiti huu. Ninanua kuuliza maswali kuhusu kuhusu ubinafsi wako; jamii yako na maisha yako ya kila siku. Pia nitauliza maswali kutumia vyombo vya kugundua kama unauugua ugonjwa wa unyongovo. Nitauliza maswali kuhusu vile unavyotumia dawa zako za kupunguza makali ya ukimwi. Ukipatikana ukiwa na dalili za unyongovu utaelekezwa kwa idara ya akili utakapopata huduma itakikanavyo.

Utafiti utakapofika mwisho, Maelwazo tutakayo kusanya haitakuwa na jina lako ili kufanya maelezo yako utakayotupa kuwa siri. Taarifa isiyo na majina itpeanwa kwaChuo kikuu cha Nairobi, kliniki ya Kibera South, na Shirika la Madaktari wasio na mpaka.

Mambo muhimu unapaswa keulewa kabla haujashiriki ni kwamba:-

1. Ushiriki katika utafiti huu ni kwa hiari yako.
2. Utafiti huu hauna madhara yeyote ila uwezekano wa adhari kutokana na utafiti huu utatokana na mshiriki kupitia usumbufu wa urefu wa mahojiano na majadiliano ya mada nyeti.
3. Hakuna faida ya moja kwa moja kutokana na ushiriki katika utafiti huu. Hata hivyo Kushiriki katika utafiti huu inahusisha kujaza fomu ya kuchunguza hali ya unyongovu. Kama maelezo kutoka fomu hii ya uchunguzi itadokeza kuwa kuna tatizo kwa afya ya kiakili itaonyesha haja ya kuanza matibabu mapema
4. Maelwazo tutakayo kusanya haitakuwa na jina lako ili kufanya maelezo yako utakayotupa kuwa siri. Utatambuliwa kwa kutumia namba za siri ili mtu mwingine asiweze kuhusisha maelezo uliotupa na wewe mwenyewe.

Iwapo una swali kuhusu utafiti huu au unataka kujua matokeo ya mwisho wa utafiti huu wasiliana na mtafiti;-

Joan Cherono Kogo,

Nambari ya simu- +254 720 972 824, Barua pepe- joan.kogo2@gmail.com

Au wasimamizi kutumia

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Iwapo utataka maelezo yoyote kutoka kwa Kamati ya maadili, wasiliana na
KNH/UON/ERC (mwenyekiti +2542726300 ext 44102)

Appendix V: Hati ya Ridhaa

**ANDIKO: UHUSIANO KATI YA UNYNGOVU KWA MAMA MJAMZITO
MWENYE VIRUSI VYA UKIMWI NA UZINGATIAJI WA MADAWA YA
KUPUNGUZA MAKALI YA VIRUSI VYA UKIMWI**

FOMU YA RIDHAA

MSHIRIKI

Mimi..... (jina la mshiriki) nimesoma/nimeskiza na kuelewa kuhusu utafiti huu. Maswali yangu yamejibiwa kwa lugha ninayoelewa, na sasa nimeridhika.

Naelewa kwamba taarifa zote nitakazotoa, pamoja na taarifa binafsi itakuwa siri.

Mimi ninakubali kushiriki katika utafiti huu.

Jina la mshiriki:

Sahihi la mshiriki:.....

Tarehe:.....

MTAFITI

Mimi (Joan kogo), nimeeleza kikamilifu kuhusu utafiti huu kwa mshirika huyu. Ninaamini kuwa ameelewa na amekubali kushiriki kwa hiari yake.

Jina la mtafiti.....

Sahihi la mtafiti.....

Tarehe.....

Appendix VI : Edenburg Perinatal Depression Scale

Edinburgh Postnatal Depression Scale

Instructions

Please circle the response that comes closest to how you have been feeling IN THE PAST 7 DAYS. Please answer all questions.

Here is an EXAMPLE already completed.

I have felt happy:

0 Yes, all the time

1 Yes, most of the time

2 No, not very often

3 No, not at all

This would mean: "I have felt happy most of the time" during the past week.

Please complete the other questions in the same way.

Please answer all questions below:

(Circle one answer in each question)

In the past 7 days

1. I have been able to laugh and see the funny side of things
 - 0 As much as I always could
 - 1 Not quite so much now
 - 2 Definitely not so much now
 - 3 Not at all
2. I have looked forward with enjoyment to things
 - 0 As much as I ever did
 - 1 Rather less than I used to
 - 2 Definitely less than I used to
 - 3 Hardly at all
3. I have blamed myself unnecessarily when things went wrong
 - 3 Yes, most of the time
 - 2 Yes, some of the time
 - 1 Not very often
 - 0 No, never
4. I have been anxious or worried for no good reason
 - 0 No, not at all
 - 1 Hardly ever
 - 2 Yes, sometimes
 - 3 Yes, very often
5. I have felt scared or panicky for no very good reason
 - 3 Yes, quite a lot
 - 2 Yes, sometimes
 - 1 No, not much
 - 0 No, not at all
6. Things have been getting on top of me
 - 3 Yes, most of the time I haven't been able to cope at all
 - 2 Yes, sometimes I haven't been coping as well as usual
 - 1 No, most of the time I have coped quite well
 - 0 No, I have been coping as well as ever
7. I have been so unhappy that I have had difficulty sleeping
 - 3 Yes, most of the time
 - 2 Yes, sometimes
 - 1 Not very often
 - 0 No, not at all
8. I have felt sad or miserable
 - 3 Yes, most of the time
 - 2 Yes, quite often
 - 1 Not very often
 - 0 No, not at all
9. I have been so unhappy that I have been crying
 - 3 Yes, most of the time
 - 2 Yes, quite often
 - 1 Only occasionally
 - 0 No, never
10. The thought of harming myself has occurred to me
 - 3 Yes, quite often
 - 2 Sometimes
 - 1 Hardly ever
 - 0 Never

For Office Use Only

Patient # _____

Administered/Reviewed by _____

Screen Administration

Self Administered: _____

Assisted: _____

Screened During

Week/Date: _____

Week/Date: _____

Week/Date: _____

Score

Total: _____

#10 Score: _____

Source: Cox, J.L. Holden J.M. and Sagovsky, R. 1987. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry* 150:782-786.

Source: K.L. Wisner, B.L. Parry, C.M. Piontek, Postpartum Depression *N Engl J Med* vol. 347, No 3, July 18, 2002, 194-199.

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Appendix VII: Fomu ya Mizani ya Edinburgh (EPDS)

Namba ya Utambulisho:

Namba ya simu:

Unapotarajia kujifungua:

Ulivyo mja mzito tungependa kujua jinsi unavyojiskia(hisi). Tafadhali tia alama katika jibu linalokaribia kabisa kueleza jinsi umejiskia katika kipindi cha siku & zilizopita sio tu unavyosikia leo.

Kwa kipindi cha siku saba zilizopita:

1. Nimeweza Kucheka na kuona jambo la kuchekesha katika mambo

- a) Ndio, kama kawaida
- b) sio, kama hapo mbeleni(awali)
- c) Kwa hakika, sio kama hapo mbeleni
- d) La, hasha

2. Nimetarajia mambo kwa furaha

- a) Kama tu hapo mbeleni
- b) Imepunguka kidogo
- c) Imepunguka kabisa
- d) Mara chache sana

3. *Nimejilaumu bila sababu wakati mambo yalipoenda vibaya

- a) Ndio, mara nyingi
- b) Ndio, mara kadhaa
- c) sio, kawaida
- d) La, sijawahi

4. Nimekuwa na wasiwasi bila sababu nzuri

- a) La, sijawahi
- b) Sio, kwa kawaida
- c) Ndio , Mara kwa mara
- d) Ndio, mara nyingi

- 5. *Nimeshikwa na woga au hofu bila sababu njema**
- a) Ndio, mara nyingi
 - b) Ndio, mara kwa mara
 - c) La, si sana
 - d) La, sijawahili
- 6. *Mambo yamekuwa yakinilemea**
- a) Ndio, mara nyingi nimeshindwa kukabiliana nayo
 - b) Ndio, mara kwa mara sijaweza kukabiliana nayo
 - c) La, mara nyingi nimeweza kukabiliana vyema
 - d) La, mara nyingi nimeweza kukabiliana vyema kama hapo mbeleni/awali
- 7. *Nimekuwa na huzuni sana hadi nimekuwa na ugumu kupata usingizi**
- a) Ndio, mara nyingi
 - b) Ndio, mara kwa mara
 - c) sio kila wakati
 - d) la, hapana
- 8. *Nimesikia huzuni sana na kutokua na furaha**
- a) Ndio, mara nyingi
 - b) Ndio, mara kwa mara
 - c) sio, kila wakati
 - d) La, hapana
- 9. *Sijakuwa na furaha kabisa hadi nimetokwa na machozi**
- a) Ndio, mara nyingi
 - b) Ndio, mara kwa mara
 - c) mara moja moja
 - d) La, sijawahi
- 10. *Nimekuwa na mawazo ya kujitendea mabaya**
- a) Ndio, mara nyingi
 - b) Ndio, mara kwa mara
 - c) sio, kwa kawaida
 - d)La, sijawahi

ALAMA

Maswali ya 1,2 and 4 (bila *)

Yana alama 0,1,2 au 3, huku chaguo la juu(a) likipewa alama 0 na la chini (d) likipewa alama 3

Maswali 3 na 5-10 (imewkwa *)

Inapewa alama zilizogeuzwa, huku chaguo la juu (a) likipewa alama 3 na chaguo la chini(d) likipewa alama 0

Alam ya juu zaidi ni 30

Uwezekano wa ugonjwa wa unyongevu ni alama ya 10 au zaidi

Kila mara ni muhimu kutazama swali #10 ambalo linaonyesha mawazo kuhusu kutaka kujiua.

MAAGIZO

1. Mama anulizwa kupigia mstari jibu moja tu kati ya majibu manne aliyopewa, jibu lililokaribia zaidi kuhusu jinsi amekuwa akihisi kwa kipindi cha siku saba zilizopita.
2. Maswali yote 10 lazima yajibiwe
3. Lazima kuwe na uangalifu kuzuia uwezekanayo wa mama kujadili majibu yake na wengine.
4. Mama lazima ajibu maswali haya mwenyewe, atsaidiwa iwapo hawezi kusoma au kufahamu lugha hii.

Appendix VIII: Case adherence index questionnaire

Case adherence index questionnaire

Please ask each question and circle the corresponding number next to the answer, then add up the numbers circled to calculate Index score.

1. How often do you feel that you have difficulty taking your HIV medications on time? By "on time" we mean no more than two hours before or two hours after the time your doctor told you to take it.

- 4 Never
- 3 Rarely
- 2 Most of the time
- 1 All of the time

2. On average, how many days PER WEEK would you say that you missed at least one dose of your HIV medications?

- 1 Everyday
- 2 4-6 days/week
- 3 2-3 days/week
- 4 Once a week
- 5 Less than once a week
- 6 Never

3. When was the last time you missed at least one dose of you HIV medications?

- 1 Within the past week
- 2 1-2 weeks ago
- 3 3-4 weeks ago
- 4 Between 1 and 3 months ago
- 5 More than 3 months ago
- 6 Never

INDEX SCORE: _____

> 10 = good adherence

≤ 10 = poor adherence

Mannheimer, et al. AIDS Care 2006;18:853-861

MASWALI KUHUSU KUTUMIA MADAWA KULINGANA NA MAAGIZO

1. Mara ngapi hujisikia mwenye ugumu wa kumeza madawa yako yakuzuia makali ya virusi kwa wakati unaostahili. Yaani kumaanisha kuwa isizidi au kupunguza masaa mawili kulingana na saa Daktari alikuelezea

4. Huwa sisikii ugumu

3. Mara chache

2. Mara nyingi

1. Kila wakati

2. Kwa kawaida, ni mara ngapi kwa WIKI/JUMA unaweza kusema huwa unakosa kunywa dawa hata mara moja

1. Kila siku

2. Siku 4 hadi 6 kwa wiki

3. Siku 2 au 3 kwa wiki

4. Mara moja kwa wiki

5. Chini ya mara moja kwa wiki

6. Sijawahi

3. Ni lini ulikosa kunywa dawa hata mara moja?

1. Wiki hii

2. Wiki moja au mbili zilizopita

3. Wiki 3 hadi 4 zilizopita

4. Mwezi 1 hadi 3 iliyopita

5. Zaidi ya miezi mitatu

6. Sijawahi

Alama-----

Appendix IX: Researcher Designed Questionnaire

The questionnaire tries to understand your social background further and explores various challenges your experience in your interpersonal relationships, family life as well as socially. Please provide us with this information and ask the researcher if anything is unclear.

SERIAL NUMBER..... DATE OF ADMINISTRATION:

SECTION I: SOCIO-DEMOGRAPHICS

- 1. Your age-----
- 2. Your marital status
 - a) Single
 - b) Married
 - c) Widowed
 - d) Separated/divorced
 - e) Cohabiting
- 3. Your educational level
 - a) No formal education
 - b) Primary school
 - c) Secondary school
 - d) College/university level
- 4. Your occupation if any
 - a) Unemployed
 - b) Self employed
 - c) Casual
 - d) Permanent and pensionable
- 5. What is your own or your family’s average monthly income in Kenyan Shillings.

.....

- 6. Are you the primary bread winner in your family?
 - a) Yes
 - b) No

SECTION II PREGNANCY and HIV RELATED DECISIONS AND EXPERIENCES

- 7. How many living children do you have?.....
- 8. How many times have you been pregnant? (include the current pregnancy)
.....
- 9. Was your pregnancy planned?
 - a) Yes
 - b) No
- 10. How did it make you feel (that you were pregnant)?
 - a) Very happy
 - b) Happy
 - c) Little happy
 - d) Sad
 - e) Very sad
- 11. How many months are you into pregnancy?
.....

SECTION III DISCLOSURE AND SOCIAL SUPPORT

- 12. Have you disclosed your status to any of your family members?
 - a) Yes
 - b) No
- 13. Do you have a special person who is a real source of comfort when you need them?
 - a) Yes
 - b) No

14. Do you experience intimate partner violence?

- a) Yes
- b) No

SECTION IV MEDICAL PROBLEMS AND STATUS QUERIES

15. Did you know your HIV status before this pregnancy?

- a) Yes
- b) NO

16. Is your spouse HIV positive?

- a) Yes
- b) No
- c) I don't know his HIV status

17. Are you using any other lifelong medication apart from ART?

- a) Yes
- b) No

18. Are you taking multivitamin, or any other supplementation e.g (blood builders)

- a) Yes
- b) No

19. What is your viral load measure within the past 6 months?

- a) What is your reason Detectable copies
- b) Undetectable copies
- c) No previous viral load measures done

20. for coming to the clinic today?

- a) Routine clinic appointment day
- b) Late appointment (Missed appointment day)
- c) Earlier than planned appointment day

SECTION V: NEGATIVE SELF PERCEIVED STIGMA SCALE

These questions are about some of your thoughts or feelings. How often have you thought or felt this way during the past 3 months because of your HIV status. Kindly Rate your experience on a scale of 0-3

Scores	0	1	2	3
	Never	Once or twice	Severally	Mostly
I felt that I did not deserve to live.				
I felt ashamed of having this disease.				
I felt completely worthless				
I felt that I brought a lot of trouble to my family				
I felt that I am no longer a person				

Appendix X: Dodoso Lilioundwa na Mtafiti

DODOSO HII INAJARIBU KUELEZA HALI YAKO YA JAMII NA PIA KUJARIBU CHANGAMOTO MBALIMBALI UNAYOKUMBANA NAYO KATIKA MAHUSIANO YAKO NA WATU, KIFAMILIA NA KIJAMII KWA JUMLA.

TAFADHALI UTUPE MAELEZO NA PIA ULIZA MTAFITI IKIWA KUNA JAMBO LOLOTE AMBALO HAILEWEKI

Namba yako ya ushiriki uliyopewa :

Tarehe :

SEHEMU YA KWANZA:

1. Umri wako?
2. Hali ya ndoa
 - a) Sina mpenzi au mume
 - b) Nimeolewa
 - c) Mjane
 - d) Nimetengana na mume/mpenzi wangu
 - e) Ninaishi na mume lakini hatujahalalisha ndoa
3. Kiwango cha elimu
 - a) Hakuna elimu rasmi
 - b) Shule ya msingi
 - c) Shule ya upili
 - d) Chuo kikuu
4. Kazi unayofanya (Iwapo Iko)
 - a) Sina ajira
 - b) Nimejiajiri mwenyewe
 - c) Ajira ya kulipwa kila siku
 - d) Ajira ya kudumu ambayo ni ya pensheni

5. Mapato wastani ya kila mwezi yako au ya familia yako kwa jumla ni.....
.....
6. Je ni wewe tegemeo msingi kifedha katika familia yako?
- a. Ndio
 - b. La

NA SEHEMU YA PILI MASWALI KUHUSU HALI YAKO YA UJAZITO NA MAAMUZI UZOEVU YAKO KULIGANA NA HALI YAKO YA VIRUSI

7. Una watoto wangapi?.....
8. Umewahi kuwa mjamzito mara ngapi?(Pamoja na mimba ya sasa)
9. Je ulikuwa umepanga kupata mimba hii?
- a) Ndiyo
 - b) Hapana
10. Ulihisi vipi ulipogundua kuwa una mimba?
- a) Nilikuwa na furaha tele
 - b) Nilifurahi
 - c) Nilifurahi kidogo
 - d) Nilihuzunika
 - e) Nilihuzunika sana
11. Mimba yako ni ya miezi mingapi.....?

SEHEMU YA TATU: MASWALI KUHUSU MSAADA WA KIJAMII NA KUELEZEA WAZI HALI YA VIRUSI VYA UKIMWI

12. Je umeelezea ye yote katika familia yako hali yako ya virusi?
- a) Ndiyo
 - b) Hapana

13. Je una mtu maalum ambaye ni chanzo halisi ya faraja wakati unapowahitaji?

- a) Ndiyo
- b) Hapana

14. Je unapitia hali ya vita katika ndoa yako?

- a) Ndiyo
- b) Hapana

SEHEMU YA NNE: MASWALI KUHUSU MATATIZO YA KIAFYA

15. Je ulijua hali yako virusi ya ukimwi kabla ya mimba hii

- a) Ndiyo
- b) Hapana

16. Je mume wako ana virusi vya ukimwi

- a) Ndiyo
- b) Hapana
- c) Sijui hali yake ya virusi

17. Je unatumia dawa yeyote ambayo inapaswa utumie kwa uhai wako mbali na dawa ya virusi

- a) Ndio
- b) Hapana

18. Je unatumia tembe za kuongeza damu au madini kwa mwili

- a) Ndio
- b) Hapana

19. Je matokeo ya damu ambayo umepimwa katika miezi misita iliyopita ya kuangaliya kiwango cha virusi mwilini yalikuwa vipi?

- a) Virusi vilionekana kwa damu
- b) Virusi havikuonekana kwa damu
- c) Sijafanya kipimo hiyo

20. Je sababu yako kuja hospitalini leo ni

- a) Leo ni siku niliyopangiwa kuja kliniki

- b) Nilichelewa kukuja kliniki siku niliyopangiwa
- c) Nimekuja kabla ya siku niliyopangiwa

SEHEMU YA TANO: TATHMINI YA HISIA ZA UNYANYAPAA

Maswali yafuatayo yanahusu hisia na fikira zako. Mara ngapi kwa miezi mitatu iliyopita umekua na hisia zifuatazo kwa sababu ya hali yako ya virusi? Tafadhali eleza uzoefu wako kwa kiwango kati ya 0-3

Scores	0	1	2	3
	Never	Once or twice	Severally	Mostly
Nilihisi kuwa sistahili kuishi				
Nilihisi aibu kwa kuwa na ugonjwa huu				
Nilijihisi kuwa sin maana kabisa				
Nilijihisi kuwa nilileta matatizo mengi katika familia yangu				
Nilijihisi kama mimi si mtu tena				