PREVALENCE AND FACTORS ASSOCIATED WITH DEPRESSION IN PREGNANCY AT MULAGO HOSPITAL, UGANDA

PRINCIPAL INVESTIGATOR: JARED O. NDEGE (MBChB)

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SUPERVISORS: DR. ANNETTEE NAKIMULI (MBChB, MMed OBS/GYN, PhD, Senior Lecturer, Makerere University)

DR.MIKE KAGAWA (MBChB, MMed OBS/GYN, Lecturer, Makerere University)

PROF. NOELINE NAKASUJJJA (MBChB, MMed Psych,PhD, Makerere University )

A DISSERTATION SUBMITTED TO THE DIRECTORATE OF RESEARCH AND GRADUATE TRAINING IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF MEDICINE (OBSTETRICS AND GYNAECOLOGY) OF MAKERERE UNIVERSITY, KAMPALA.

2018
DECLARATION

I declare that this dissertation is my original work and has never been presented or submitted anywhere for the award of any degree before. I therefore present it for the award of the degree of Master of Medicine (Obstetrics and Gynecology) of Makerere University, Kampala, Uganda.

SIGNED: ____________________________

DATE: 28/06/18

DR. NDEGE O. JARED (AUTHOR)

This dissertation has been submitted with the approval of the following supervisors:

SIGNED: ____________________________

DATE: ______/______/_______

DR. ANNETTEE NAKIMULI (SENIOR LECTURER)

SIGNED: ____________________________

DATE: 5/1/2018

PROF. NOELINE NAKASUJJA (PhD PSYCHIATRY)

SIGNED: ____________________________

DATE: 16/7/2018

DR. MIKE KAGAWA (LECTURER)

APPROVED BY THE HEAD OF DEPARTMENT- OBSTETRICS AND GYNECOLOGY

SIGNED: ____________________________

DATE: 03/07/2018
DEDICATION

I dedicate this book to my beloved wife, Dr. Joyce Akuka and my wonderful daughter Layla Annabel for their extreme support, prayers, encouragement, patience and understanding during the entire period of my course.
ACKNOWLEDGEMENT

Great thanks to God who provided life and all resources required for this work to be successful.

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<tbody>
<tr>
<td>ANC</td>
<td>Antenatal Care</td>
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<tr>
<td>DSM</td>
<td>Diagnostic and Statistical Manual</td>
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<td>DM</td>
<td>Diabetes Mellitus</td>
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<td>EPDS</td>
<td>Edinburgh Postnatal Depression Scale</td>
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<td>HIV</td>
<td>Human immunodeficiency virus</td>
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<td>HTN</td>
<td>Hypertension</td>
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<tr>
<td>HPAA</td>
<td>Hypothalamus Pituitary Adrenal Axis</td>
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<tr>
<td>MDD</td>
<td>Major Depressive Disorder</td>
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<td>MDEs</td>
<td>Major Depressive Episodes</td>
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<td>PI</td>
<td>Principal Investigator</td>
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<td>QOL</td>
<td>Quality Of Life</td>
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<td>SDG</td>
<td>Sustainable Development Goal</td>
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<td>TA</td>
<td>Telomerase Activity</td>
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<td>TL</td>
<td>Telomere Length</td>
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<td>UDHS</td>
<td>Uganda Demographic and Health Survey</td>
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<td>UK</td>
<td>United Kingdom</td>
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<td>WHO</td>
<td>World Health Organization.</td>
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OPERATIONAL DEFINITIONS:

Depression: A score of 13 or more on the Edinburgh Postnatal Depression Scale.

Major Depressive Disorder: DSM V definition of major depression disorder.
ABSTRACT

Introduction:

It is estimated that 10% of pregnant women experience some type of mental disorder, most commonly anxiety or depression. Unfortunately, the burden of depression among pregnant Ugandan women is unknown. The objective of the study was to determine the prevalence and factors associated with depression among pregnant women attending Antenatal Care in Mulago Hospital, Uganda.

Methods: This was a cross sectional study. Eligible women attending Antenatal Care were enrolled via systematic sampling. Those who consented to participate in the study had questionnaires completed on patients’ biodata and factors that could potentially be associated with depression. Edinburgh Postnatal Depression Scale was used to assess for depression in these mothers and Major Depressive Disorder confirmed by Diagnostic and Statistical Manual V. To determine associated factors bivariate and multivariate analysis were done.

Results: A total of 367 pregnant women were enrolled into the study in which the prevalence of depression was 5%. Factors which were significantly associated with ante partum depression included pregnancy at younger age, less than 20 years (p-value=0.018) and advanced maternal age (p-value=0.049).

Conclusion: This study has shown that depression symptoms are common in pregnancy. Predictors for depression included pregnancy at younger age (less than 20 years) and advanced maternal age. This study therefore supports the need for integrating mental health and antenatal care for women in the reproductive age group in Mulago hospital.
CHAPTER ONE

1.0. INTRODUCTION

1.1. Background

World Health Organization defines health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. It is therefore important to establish the burden of mental disorders among pregnant women as it impacts directly on their physical health and health seeking behaviours [1].

Unfortunately, maternal mental health has been neglected in the national health policies of many low and middle-income countries [2]. Ministries of health, Uganda and non-state players like the United Nations have been trying to address the challenges of maternal mental health though most issues have not been addressed [3].

Depression is characterized by depressive mood, diminished interest or pleasure in activities, loss of energy or fatigue nearly every day, loss of confidence or self esteem, unreasonable feeling of self reproach or excessive or inappropriate guilt, change in appetite, suicidal ideations, insomnia or hyper insomnia[4].

According to DSM V, depressive disorders include mood dysregulation disorder, major depressive disorder, persistent depressive disorder, premenstrual dysphoric disorder, substance/medication induced depressive disorder and unspecified depressive disorder[4].

Mental health issues are about three times more common than other medical and obstetrical problems that women are routinely screened and treated for in pregnancy [5, 6]. In addition, pregnancy is perceived as a joyous and fulfilling moment for women but they are at risk of depression during pregnancy [6]
Depression is among the most prevalent psychiatric disorders affecting women [7]. Depressive disorders are predicted to be the second leading cause of global disability burden by 2020; unipolar depressive disorders rank among the top five with respect to global burden of disease[8]. The risk of depression increases significantly during pregnancy [9, 10] and clinically significant depressive symptoms are common in mid and late trimesters [10]. Several studies have reported that depressive symptoms are more frequent during pregnancy than during the postpartum period [9, 11-13].

Worldwide about 10% of pregnant women and 13% of women who have just given birth experience a mental disorder that may include anxiety, depression and organic psychosis [14]. Ante partum depression and anxiety affects both the mother and the offspring. A study done in Tanzania in 2010 put the prevalence at 39.5%[15]. Similar studies done in Ethiopia in 2015 and Ghana in 2014 showed ante partum prevalence of 24.94% and 9.9% respectively[16, 17] The women who are single, in a poor relationship, of low socio-economic status, or those who have a number of life stressors are at a higher risk of developing depression [14].

1.2 Problem statement

Pregnancy used to be regarded as a period during which women are relatively protected from psychiatric morbidity, however, contemporary epidemiological studies in the UK, Canada, Australia, Japan, Portugal [18] show that antenatal depression is more common than previously believed. These studies show that between 10% and 20% of pregnant women suffer from depression of clinical significance. The prevalence of depression during pregnancy can be as high as 16% or and 5% for those with major depression [19].
A study done in Brazil put the prevalence of antenatal depression at 14.8% [20]. Postnatal depression has captured the attention of researchers, clinicians and lay public, but comparatively little is known about depression during pregnancy. Mental disorders have become a big challenge in developing countries with an estimated prevalence of 15.6% during pregnancy and 19.8% after child birth [14]. Depression ranks among the top five with respect to global burden of disease [14].

Ante partum depression and anxiety affects both the mother and her offspring; unfortunately, there is scanty data on prevalence of common mental disorders in pregnant women in Sub-Saharan Africa[2, 21]. A study done in Ethiopia put the prevalence of antenatal depression at 24.94% [16], and another study in Ghana put it at 9.9% [17]. The prevalence of ante partum depression in Uganda had not been established prior to this study; furthermore no study had been done on depression in pregnancy at Mulago Hospital yet it has profound poor maternal-fetal outcomes.

Depression has been linked to adverse outcomes for mothers and children. Pregnant depressed women tend to have preterm births, intrauterine growth restriction and low birth weights with increased poor perinatal morbidity and mortality [6]. In most countries, health care delivery focuses more on the physical aspect leaving mental issues completely neglected [22]. It has been observed in Mulago Hospital that more emphasis are on the physical health leaving mental health unattended to.

Poverty, lack of support from spouse and violence are among the factors associated with depression in pregnancy [20]. According to 2016 UDHS, total fertility rate is at 5.4 and the age of child bearing is early with 25% of adolescents aged 15-19 years already mothers hence the need to establish the burden and mitigate against its debilitating effects. The burden of depressive disorders amongst ANC mothers of Mulago Hospital was unknown at the time the study was commenced. This study
sought to establish the prevalence and factors associated with depressive disorders amongst these mothers.

1.3 Justification of the Study

Most studies on maternal mental health focus on the postpartum period, much has not been done during pregnancy; however it has been established through contemporary epidemiological studies that there is significant burden of ante partum depression [18, 22]. The global prevalence of ante partum depression is 10% [14], a study in Ethiopia put it at 24.94% [16], Ghana 9.9% [17], 39.5% in Tanzania [15].

At the time of commencement of the study, the burden of depression amongst ANC mothers of Mulago Hospital and Uganda at large was unknown and there is no Ministry of Health Policy guideline on management of maternal depression. This study helped to unravel the burden of ante partum depression in Mulago Hospital; this will give an insight to health policy makers, to enable them formulate a policy guideline on mental health package, come up with a screening tool that can be used at ANC clinic; this would ensure holistic delivery of comprehensive ANC services. This will subsequently improve maternal health and overall health care delivery.

The knowledge on factors associated with the development of depression during pregnancy allows early adoption of interventions for monitoring actions of mental health throughout the prenatal, preventing this and other mental disorders that may be triggered at this stage of a woman’s life and contributing to an adequate and highly qualified prenatal care.
This would be part of the promotion of maternal and child health in line with SDG 3 which seeks to provide good health and well being, and may reflect favorably on maternal outcomes and better conditions of newborns[20].

1.4. Research questions

i. What is the prevalence of depression among women attending the Ante Natal care clinic at Mulago Hospital?

ii. What are the factors associated with depression among women attending ANC clinic at Mulago Hospital?

1.5. Objectives

1.5.1. General Objective

1. To establish the prevalence and factors associated with depression among women attending the antenatal clinic at Mulago Hospital.

1.5.2. Specific Objectives

1. To determine the prevalence of depression among women attending the antenatal clinic at Mulago Hospital.

2. To determine factors associated with depression among women attending antenatal clinic at Mulago Hospital.
1.6. Conceptual Framework using the stress vulnerability Model of depression by Zubin and spring (1977)

This conceptual framework focuses on the factors associated with maternal depression. Not all the socio-demographic, psychosocial, behavioral, and obstetric and biological factors mentioned above were evaluated in this study.

Women have a higher risk of experiencing depression than men with an estimated lifetime risk of 10–25% [23, 24]. The risk is even higher during pregnancy [18, 19] and clinically significant depressive symptoms are more common in mid and late trimesters [9,10]. Stress vulnerabilities play an important role in depression and health outcomes in women[25]. They are based upon a number of factors associated with acute and chronic stress, including individual chronic/acute burdens, the biological environment, and the psychosocial environment [25].

The variety of complex and potential stressors in an individual’s life may interact and contribute to increased risk of depression. In addition, the experience of depression may heighten an individual’s tendency toward experiencing stressful episodes. Persistent and profound stressors may prevent regulatory mechanisms from adjusting appropriately, continuing the cycle of neurobiological dysregulations, poor health outcomes, and potentially advanced cellular aging [25-27].

Individual chronic and acute burdens involve an accumulation of life stressors that may include current or past stressful life events and current or past illnesses (e.g. chronic or acute psychological or physical illnesses). Acute stressful life events and current or past illnesses may precipitate or exacerbate depressive symptoms. Preliminary human studies suggest that the quality of the early childhood environment can shape brain development with associated changes to neuroanatomical structure/function and receptor levels/gene expression [28] ; theoretically, any of these changes may either be adaptive (and lead to adaptive behaviors and decreased risk of depression) or disruptive (and lead to unhealthy behaviors and a high risk for depression [29]. Stressful early childhood experiences can significantly undermine the development of adaptive coping skills required to deal with challenges in adulthood and may also create the foundation
for unhealthy lifestyles, negative interpersonal relationship patterns, and poor health outcomes [29, 30].

Women with a history of childhood traumas, such as sexual abuse, and low levels of current social support are at higher risk of unintended pregnancies, which are associated with prenatal and postpartum depression[31, 32]. To continue this example, a woman with an unintended pregnancy may find herself unprepared to serve in a social role in which she is expected to put others’ needs ahead of her own, which can be acutely and chronically stressful and is highly related to both prenatal and postpartum depression[31].

Psychosocial vulnerabilities that play a role in the impact of depression on health outcomes include demographics/socioeconomic status, perceived social support, lifestyle, and interpersonal situations. Socioeconomic status is clearly linked to stress vulnerability, as seen in low-income populations which have high levels of stress, impaired coping, and depression[31]. Persistent socioeconomic inequalities are linked with stress vulnerability, particularly with regards to educational and financial opportunities; these inequalities are also linked with health disparities and unhealthy lifestyle choices and poor health outcomes[30, 33].

Negative interpersonal situations, such as intimate partner violence (IPV) and low perceived social support, add additional vulnerability for stress and depression in women[34] ; fortunately, long-term sequelae of traumatic experiences such as IPV and early childhood abuse may be attenuated by higher perceived social support[35, 36].

Non violent gender-specific interpersonal situations may also place additional wear and tear on women’s mental and physical health, particularly if there are feelings of guilt or selfishness associated with participating in healthy self-care activities rather than focusing on the financial or other needs of the family,[37-40].

There also appear to be biological vulnerabilities that affect women, in particular, such as temperament, inherited and epigenetic changes and dysregulated stress response systems[26, 41].
Epigenetic research suggests that social experiences in both childhood and adulthood may significantly modulate stress reactivity and depression [28].

Psychobehavioral factors play an important role in the development and maintenance of depressive states. A woman’s perception of stress and her response to that appraisal are important moderators in the relationship between stress and depression; the degree to which an individual perceives that stress to be significant and to what degree the individual thinks she, in this case, has control over the situation [42].

Important factors of stress perception are related to individual differences in personality and cognitive styles in the face of challenges. Studies suggest that individuals with stressful life situations, because of environmental factors outside of the individuals’ control, have higher stress-related psychoneuroimmunologic changes [43-45].

Second, every individual has more or less tendency toward ruminations, or persistent repetitive negative thinking, those with heightened attention to and perception of stressors may, in fact, have a biased perception toward negative emotions; for example, increased levels of ruminations on stress may affect levels of depression [46].

When experiencing depression, women quite often report negative ruminations, which are in-turn related to low self-esteem, hypersomnia, and anxiety [41, 47].

Ruminations may be particularly problematic for women because they can increase the stress of depression by inducing negative thoughts about the past, present, and/or future. Ruminations are associated with lower levels of social support and increased suicidal ideations, all of which continue the cycle of stress and prolonged depression [48].

A few biological pathways have been elucidated to show the link between some physiological factors and depression e.g. heightened inflammatory activation [49], hyperactivity of the
hypothalamic-pituitary-adrenal axis[50], and more recently, genetic and epigenetic alterations [51].

Currently, the biological link between the microbiome and depression is being studied, focusing on the activation of the central nervous system (CNS) signaling systems by gastrointestinal bacteria[52].
CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction:

Depression is a leading cause of disability and disease burden worldwide, affecting millions of individuals worldwide, particularly women. Women have a high risk of experiencing depression with an estimated lifetime risk of 10–25% [23, 24]. This increased vulnerability to depression starts in puberty and continues through menopause[26]. Depression is of public health concern because of the short and long term detrimental effects to the woman and her family.

Individuals with depression experience high rates of anxiety, suicidality, substance use, and poor spouse/child relations[53, 54]; depression is also highly related to prevalent health outcomes such as cardiovascular disease [55]. The core symptoms of a major depressive episode are: a persistent depressed mood, difficulty concentrating or decision making, decreased energy, loss of interest in previously pleasurable activities, weight changes, changes in sleep (insomnia or hypersomnia), psychomotor changes (agitation or retardation), a pessimistic outlook with or without suicidal ideation[56].

Appropriate treatment of depression is essential, yet many depressed women find the usual depression care (e.g. antidepressant medications and/or psychotherapy) to be inappropriate due to various concerns about cost, side effects, or inadequate relief of symptoms[38]. According DSM V, these disorders include mood dysregulation disorder, major depressive disorder, persistent depressive disorder, premenstrual dysphoric disorder, substance/medication induced depressive disorder and unspecified depressive disorder. Maternal depression, a non-
psychotic depressive episode of mild to major severity, is one of the major contributors of pregnancy-related morbidity and mortality.

Maternal depression (ante partum or post partum) has been linked to negative health-related behaviours and adverse outcomes, including psychological and developmental disturbances in infants, children, and adolescents [5, 57]. Depression during pregnancy negatively influences social adjustment and marital relationships [58, 59]. It affects also the mother infant interaction through its influences on the occurrence of postnatal depression [60, 61].

Unidentified and untreated depression can cause detrimental effects on both the mother and the child, at the extreme being suicide by the mother [62, 63]. Studies also showed that there is a significant associations between antenatal depression and poor infant outcomes (low birth weight, preterm delivery or both, fetal growth restriction) in low [64-66] and middle income countries [67].

Those who are depressed are more likely to engage in unhealthy practices such as smoking and illicit substance abuse; they tend to have poor nutrition due to lack of appetite. This translates to poor weight gain during pregnancy and risking intrauterine growth restriction [62]. They are less compliant with prenatal care and feel less interested in the care towards their pregnancy. There is an associated increase in pain, discomfort, nausea, abdominal pain, shortness of breath, dizziness in these mothers during pregnancy[62].

It has been observed that maternal depression leads to an alteration in the maternal neuroendocrine axis and uterine blood flow which may contribute to premature delivery, low birth weight and preeclampsia [68, 69]. Depressions in the second and third trimesters are most
highly associated with negative birth outcomes [70]. Babies born to depressed mothers have elevated cortisol and catecholamine levels at birth [70]. The infants cry more and are not easy to console than those born to non-depressed [71].

Much greater emphasis has been placed on perinatal depression during the post-partum period, with relatively less attention paid to depression in the ante partum period[12, 72]. Pregnancy is a major life event that is inevitably accompanied by social, psychological, and hormonal changes hence the mental health of these mothers should be given priority during ANC visits [73].

2.1. The prevalence of depression in pregnancy:

Worldwide it is estimated that 10% of pregnant women and 13% of women who have just given birth experience a mental disorder [14]. The prevalence of ante partum depression ranges from 7% to 15% in high-income countries [1, 66], and 19–25% in low-income and middle income countries [74]. Notably, the prevalence of post-partum depression among women residing in high-income countries is reported to be approximately 10 % and 20% for women in low-income and middle-income countries [75].

High prevalence of antenatal depression has been reported from developing countries; 29 % in Bangladesh [76], 25 % in Pakistan [1], 20.2 % in Brazil [77]. Studies on this subject have been scarce in the African setting [21]. A study done in rural South Africa in 2011 on ante partum depression showed that 47% of women recruited met the criteria for major depressive episode[21], prevalence of antenatal depression in Ethiopia is at 24.94 % [16], Ghana 9.9 % [17], 39 % in South Africa, Cape Town [78], 38.5 % in South Africa KwaZulu-Natal [79] and 39.5 %, in Tanzania [15].
Depression is more frequent in the second trimester. This is related to concerns and fear of not returning to the previous physical form and insecurity about the future of the relationship in marriage [80].

In Mulago, the burden of depression in pregnancy is unknown yet if discovered, then the antenatal clinic package can be expanded to include assessment for depressive disorders owing to deleterious effects on maternal mental health, fetal well being and childhood growth and development.

2.3 Factors associated with depression in pregnancy:

The high prevalence of perinatal depression in low and middle income countries of 19% -25% [74] is influenced by risk factors such as increased somatic symptoms; this group of clients experience extreme anxiety about physical symptoms such as pain or fatigue, they may experience significant emotional and physical suffering [81] exposure to intimate partner violence, [61] little social support [16] unintended pregnancy [82].

Ante partum depression has been linked to negative health related behaviours such as poor nutrition, increased substance abuse and adverse outcomes, including inadequate antenatal care, pre-eclampsia, low birth weight, preterm delivery, post-partum depression, and suicide [83].

Number of pregnancies, births and children and family support are also associated with depression. Risk is higher in primigravidae women due to inexperience of mothers coupled with fear of childbirth leading to psychological maladjustment ; furthermore since they have not experienced a previous pregnancy ,they may feel insecure [84, 85].
Depression is also higher in women who have had higher number of births and children; this can be explained by negative experiences in previous pregnancies and births as well as concerns about other children [86]. Good family support is a protective factor against depression during pregnancy. Support functions as a moderator of feelings arising from pregnancy representing an asset to face possible adversities of this period that makes women less vulnerable to psychiatric disorders [87].

Alcohol consumption is related to higher incidence of prenatal depression. The presence of mental disorders may contribute to the use of psychoactive substances and vice versa. Pregnant women who use alcohol tend to have more depressive symptoms; the reverse path also possible that is depression precedes the use of alcohol, pregnant women can also take alcohol to alleviate the symptoms of depression[88-90].

Pregnant women who use medications on daily basis e.g. those who are on treatment for chronic medical conditions like chronic hypertension, diabetes mellitus e.t.c are likely to experience depression during pregnancy coupled with fear of childbirth, they experience psychic maladjustments and use more medication for this reason [85, 87].

Present research shows that women who have a history of mental disorder are more likely to experience depression during pregnancy; a study done in South Africa showed that 35.7% of pregnant women who had at least one mental disorder prior to pregnancy had depression during pregnancy [79].

Pregnant women with a striking life event in the last twelve months and those with history of domestic violence have increased risk of gestational depression; this can be explained by
accumulation of stress triggered by key events in the last twelve months leading to negative outcomes in the mental health of pregnant women due to physical and mental wear involved. History of violence is a generator of sadness and distress for the pregnant women when they recall the humiliation suffered [88].

Women who experience ante partum depression often continue to experience depressive symptoms into the post-partum period, with more than 54% of those with post-partum depression reporting depressive episodes before or during pregnancy [3, 12].

Ante partum depression in low-income and middle-income countries remains under recognized and under treated because greater priority has been assigned to preventing deaths related to obstetric complications [12]. Untreated ante partum depression is of concern because of its association with post–partum depression, and poor physical and neurocognitive developmental outcomes in infants [72].
CHAPTER THREE

METHODS

3.1. Study Design

This was a cross sectional study

3.2. Study Setting

The study was conducted in the antenatal clinic of Mulago National Referral Hospital. The department of obstetrics and gynaecology is temporarily located at Kawempe Hospital. The antenatal clinic is located on level one of the Hospital. Pregnant women are seen at this clinic daily from Tuesday to Thursday. The women are screened for infections, medical conditions and pregnancy related complications. Routine tests are carried out like complete blood count, HIV test, syphilis test, blood grouping, urinalysis and other tests as the need may arise. On average 200 are seen on a clinic day, of these 130 have high risk pregnancies. They have medical conditions or risk factors/pregnancy related complications that require attention by the doctor.

3.3. Population

3.3.1 Study population

The study population comprised pregnant women.

3.3.2 Target population

Pregnant women at Mulago hospital.

3.3.3 Accessible population

Pregnant women who attended the ANC clinic on evaluation days
3.4. Eligibility criteria

3.4.1. Inclusion Criteria;

a) Pregnant women who attended ANC at Mulago Hospital.

b) Pregnant women in the ANC clinic who consented to participate in the study.

c) Pregnant women in the ANC clinic during the study period.

3.4.2. Exclusion criteria;

a) Women who were too ill to respond to the interviewer administered questionnaire or those who needed urgent attention like those with severe anaemia, eclampsia, ante partum, haemorrhage.

b) Women who lacked insight hence unable to respond to the interviewer administered questionnaire.

3.5. Sampling Procedure

Recruitment of participants was done through Antenatal care clinic (ANC). Systematic sampling was used whereby every twentieth mother according to the registration book and satisfied the eligibility criteria was recruited. This enabled me recruit ten women per day because on average two hundred clients were seen at the clinic daily. Each participant was allocated thirty minutes. The first participant for the study was randomly picked from the ante natal registration book.

The research assistants and/or the principal investigator comprehensively explained to the selected participants the purpose of the study, benefits, and risks and thereafter requested for their participation. The eligible clients who agreed to participate signed consent form by writing their name and signature and were subsequently assigned a study number. Participants were interviewed on each of the clinic days per week for 3 months.
3.6. Sample size

The sample size for single proportions was determined by using a formula by Kish Leslie (1965)

\[ n = \frac{z^2 pq}{d^2} \]

Where \( n \) = sample size, \( d = 5\% \) precision = 0.05, \( q = 1-p \), \( p = 0.5 \) (50\%)

\( z = Z \) score corresponding to 5\% at the level of significance (1.96)

A study done in Tanzania in 2010 showed an antepartum depression prevalence of 39.5\%

Kaaya SF et al in 2010) published in Tanzan J Health Res. 2010; using the above formula

Prevalence (P) of depression 39.5\%

\[ n = \frac{(1.96)^2 \times 0.395 \times 0.605}{0.05 \times 0.05} \]

\[ n = 367 \]

The sample size estimation for factors associated with depressive disorders in pregnancy was based on the hypothesis that the prevalence of depression would be the same among women with planned and unplanned pregnancies. The following formula for comparing two proportions by Fleiss (REF: Fleiss, Statistical Methods for Rates and Proportions, formulas pages 3.18 & 3.19) and as applied in the OpenEpi Calculator accessed at

http://www.openepi.com/SampleSize/SSCC.htm was used.

\[ N = \left[ z^2 \left[ \frac{p(1-p)}{q_1} + \frac{p(1-p)}{q_2} \right] + Z^2 \sqrt{\frac{p_1(1-p_1)}{q_1} + p_2(1-p_2)} \right]^2 \]

The notations in the formula were defined as follows:

\( \alpha = \) Type 1 error defined as the probability of falsely rejecting the null hypothesis when it is correct, arbitrary taken as 5\%.

\( Z = \) The standard normal statistic corresponding to 1.96 when two sided test is considered.
$\beta$ = Type II error defined as the probability of falsely failing to reject the null hypothesis when it is incorrect, taken as 20%.

$P = \text{Is the average of } P_1 + P_2 \text{ and } q \text{ defined as } 1 - p.$

Assuming power of 80% , type 1 error of 5% and the prevalence of depression in planned pregnancies to be 28% and 72% in unplanned cases based on a cross sectional study of prevalence of antenatal depression and associated factors among pregnant women in public health centres in Addis Ababa, Ethiopia (2015) . The study showed that women who had not planned their current pregnancy were 2.58 times more likely to have antenatal depression than those who had planned; the following sample size estimates were obtained.

Two-sided confidence level(1-alpha) 95
Power(% chance of detecting) (1-\(\beta\)) 80
Ratio of sample size (unplanned/planned pregnancies) 2.6
Percentage of depression in planned pregnancies (\(P_1\)) 28
Percentage of depression in unplanned pregnancies (\(P_2\)): 72
Least extreme Odds Ratio to be detected: 2
Sample Size – for women with unplanned pregnancies 158
Sample Size – for women with planned pregnancies 158
Total 316

The first sample of 367 was used in this study since it was larger of the two.

3.7 Study Variables

3.7.1. The dependent variable was prevalence of depression in pregnant women. The prevalence of depression was calculated as a percentage of the women with the disorder over the total number recruited.
3.7.2. The independent variables were factors associated with depression which included socio-demographic, psychosocial factors, behavioural factors, biomedical, behavioral and obstetric/gynecologic factors.

3.7.2.1. Psychosocial factors: Explored the association between depression and psychosocial factors such as domestic violence, family stressors and social support.

3.7.2.2. Behavioural factors: Substance use/abuse has been associated with increased risk of depression. This study looked at alcohol use/abuse, cigarette use/abuse any other substances of abuse a participant could be using.

3.7.2.3. Obstetric / gynaecological factors: This study investigated if there was an association between depression in pregnancy and the following obstetric and gynaecological factors; parity, poor obstetric outcomes such as abortion, type of pregnancy whether planned or not, the mode of delivery whether vaginal or caeserian section.

3.7.2.4. Socio-demographic factors: Assessed the association between socio-demographic factors such as age, marital status, income levels, and level of education and depression in pregnancy.

3.7.2.5. Biomedical factors: The study sought to establish if there was an association between depression and history of chronic illness such as chronic hypertension, diabetes mellitus, and convulsive disease and prior history of mental illness in the participant. HIV screening is routinely done at ANC hence we were able to establish the serostatus of the participants; they self reported as to whether they are diabetic or not. Blood pressures of the participants were also established as they are routinely screened at the ANC clinic.

3.8. Data Management

3.8.1. Data Collection
Data collection started after registration of the mothers in the ANC register.

Data on socio-demographic/economic, behavioral, biomedical and obstetric factors was collected using interviewer administered questionnaires while that on establishing the prevalence of depressive disorder was collected using Edinburgh postnatal depression scale instrument and diagnoses of MDD confirmed using the DSM V module on depression.

EPDS consists of 10 items each defined by a series of symptoms. Each item is scored on a scale of 0 (absent) to 3 (severe). A maximum score of 30 with a score of 10 or greater suggestive of a possible depression. Like other similar studies conducted abroad, Ethiopia, inclusive EPDS cut off point of 13 identifies pregnant women with depressive symptom [91, 92]. Those who score 13 and above are categorized as depressed women while scores below 13 are considered as non depressed [92].

This tool is related to DSM V one of the standard tools used as diagnostic criteria for mental disorders. The assessment questions in EPDS are all part of DSM V and these are applicable in assessing depression even in the African setting.

At Kaunas University of Medicine, Lithuania, a random sample of 94 women were interviewed 2 weeks postpartum and an internal consistency of EPDS using Cronbach’s alpha coefficient was at level 0.83, 92% sensitivity and 73% specificity hence has a good reliability for depression screening. In 2012, EPDS was used to assess the prevalence of antenatal depression and associated factors among pregnant women in Ethiopia [16].

Two Research assistants were trained on the study procedures, ethical issues and data collection. The principal investigator and the research assistants enrolled eligible clients for the study. The
principal investigator directly supervised the data collection process. An interviewer administered questionnaire was used to collect the data.

The data collection tool was pretested for three days on six women and any shortfalls arising corrected. Pretesting of the data collection tool was done at ANC clinic Mulago. The completed questionnaires were checked for accuracy and completeness to ensure that high quality data is maintained throughout the study. Data collected was coded and entered into a computer using EPI data. Double data entry to minimize errors was employed. The PI kept the completed data collection forms under lock and key. The PI was the only person with access to this stored data.

3.8.2. Duration of study
The study was conducted over a period of three months.

3.8.3 Data processing and statistical Analysis
Quality of the data collected was cross checked daily for completeness of the questionnaires by the PI or by the research assistants. In addition, the data was checked for missing information. Data was double entered into Epidata 3.1 by the PI and the statistician. It was analyzed using STATA version 13.

Data backup drive was created in the PI’s computer and other backup data were created on flash discs and CDs. Completed questionnaires were stored in a cabinet under lock and key.

The prevalence of depressive disorders was calculated by the number of women who had disorders divided by the total number of women recruited into the study. To assess factors
associated with depressive disorders in pregnancy, bivariate analysis was performed to compute odds ratios at the 95% level of significance.

To assess independent association of these risk factors, multivariate analysis was performed, where all independent variables with a p-value of less than 0.2 at bivariate analysis and those with biological significance were considered for multivariate logistic regression. Associations with p-value less than 0.05 were considered statistically significant. The results of the analysis presented in tables.

3.9. Quality Control

Prior to commencement of data collection, 2 midwives at ANC were trained on good communication skills, questionnaire administration and to emphasize on research ethics. A pretest of research tools was done on 10 volunteer mothers at ANC to assess if it would generate the information required.

Regular fortnight meetings were held between the PI and the research assistants to share on experiences, challenges, performance and progress on data collection. Regular meetings with the statistician were also conducted. All the clients recruited were assigned identification numbers; this ensured confidentiality.

3.10. Ethical Considerations

Permission to conduct the research was sought from research committees of Department of Obstetrics and Gynaecology, School of Medicine Research and Ethics committee (#REC REF 2017-113), Mulago hospital and Uganda National Council of Science and Technology.
Informed consent was sought from the participants. It was emphasized to the participants that participation and withdrawal from the study was voluntary. All participants diagnosed with depression were linked to mental health care at Mulago Mental Health Clinic.

3.11. Dissemination of results

Findings of this study will be available in the Department of Obstetrics and Gynecology, Department of Psychiatry Makerere University, Makerere College of health sciences, Albert Cook Library, Ministry of Health, publication of work done will be made in Peer Review Journals. I will make presentations at the Local and international conferences.
CHAPTER FOUR

4.0 PRESENTATION OF RESULTS

4.1 Prevalence of depression among study participants

A total of 367 study participants were recruited, 17 (5%) of them had depression as diagnosed by Edinburgh Post natal Depression Scale. Five (1.4%) of the study participants had major depressive disorder as diagnosed by DSM V.

4.2 Socio-demographic characteristics of participants

The socio-demographic characteristics of the study participants are shown in table 1. The age of the participants ranged between 17 and 50 years with a mean of 26.3 ± 5.3 years. Most of the participants 309(84%) were aged 20-34 years while 29 (8%) were less than 20 years old. Only 8% of the participants were over 34 years.

Majority of the participants 310 (84%) were either married or cohabiting and only 57(16%) were separated, single or divorced. Majority 302 (82%) had good relationship with their partners, only 65 (18%) cited bad relationship with their spouses. 240 (65%) of the participants got support from the family while 127(35%) did not. Less than half of the participants 115(31%) had experienced some form of violence which included; sexual abuse, physical violence, among others.
Table 1: Socio demographic characteristics of study participants:

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Frequency (n=367)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>29</td>
<td>8</td>
</tr>
<tr>
<td>20-34</td>
<td>309</td>
<td>84</td>
</tr>
<tr>
<td>&gt;34</td>
<td>29</td>
<td>8</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married/cohabiting</td>
<td>310</td>
<td>84</td>
</tr>
<tr>
<td>Separated/divorced/single</td>
<td>57</td>
<td>16</td>
</tr>
<tr>
<td>Relationship status with spouse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>302</td>
<td>82</td>
</tr>
<tr>
<td>Not good</td>
<td>65</td>
<td>18</td>
</tr>
<tr>
<td>Support received</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>127</td>
<td>35</td>
</tr>
<tr>
<td>No</td>
<td>240</td>
<td>65</td>
</tr>
<tr>
<td>History of domestic violence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>115</td>
<td>31</td>
</tr>
<tr>
<td>No</td>
<td>252</td>
<td>69</td>
</tr>
</tbody>
</table>
4.3 Socio-economic and behavioral characteristics of study participants:

The mean earning of the participants was 296000 ± 241000 Uganda shillings. The least earning was 20,000 and the greatest earning was 1,200,000 Uganda shillings. In terms of the meals per day, majority of the participants 208(57%) took three or more meals daily while only 14 (4%) could afford a meal or none per day.

The behavioral characteristics included; alcohol consumption and use of drugs of abuse which included cigarettes, bhang and cocaine by the participant during pregnancy. Majority of the participants 342 (93%) did not take any alcohol during pregnancy, only 25 (7%) mentioned history of alcohol intake during pregnancy, of which 24(96%) took beer and only 1 (4%) took Waragi. Majority 365 (99%) did not use any substances of abuse mentioned above.

Other factors are as shown in table two below;
Table 2: Socio-economic and behavioural characteristics of study participants:

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Frequency (n=367)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level of education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>primary and below</td>
<td>246</td>
<td>67</td>
</tr>
<tr>
<td>secondary and tertiary</td>
<td>121</td>
<td>33</td>
</tr>
<tr>
<td><strong>Participants’ monthly earning (Ugshs.)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;=200,000</td>
<td>105</td>
<td>29</td>
</tr>
<tr>
<td>&gt;200,000</td>
<td>96</td>
<td>26</td>
</tr>
<tr>
<td>No income</td>
<td>166</td>
<td>45</td>
</tr>
<tr>
<td><strong>Partner’s earning (Ugshs.)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;=500,000</td>
<td>122</td>
<td>33</td>
</tr>
<tr>
<td>&gt;500,000</td>
<td>56</td>
<td>15</td>
</tr>
<tr>
<td>Do not know</td>
<td>188</td>
<td>51</td>
</tr>
<tr>
<td><strong>Major meals per day</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(=One meal)</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>(Two meals)</td>
<td>145</td>
<td>40</td>
</tr>
<tr>
<td>(&gt;=Three meals)</td>
<td>208</td>
<td>57</td>
</tr>
<tr>
<td><strong>Alcohol consumption</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>25</td>
<td>7</td>
</tr>
<tr>
<td>No</td>
<td>342</td>
<td>93</td>
</tr>
</tbody>
</table>
4.4: Obstetric, gynaecologic and biomedical characteristics of study participants:

More than half, 231(63%) of the participants were multiparous, 136 (37%) were primigravidae. Majority 257(70%) of the participants were in third trimester and only 5(1%) were in first trimester. Majority 298 (81%) of the participants planned their pregnancies, only 69(19%) had unplanned pregnancies.

Majority 330 (90%) of the participants had complication free pregnancies, only 37(10%) reported complications. 140 (61%) of the participants had spontaneous vaginal deliveries, while 91(39%) of them had either assisted vaginal delivery or caeserian sections. The rest are as shown in table 3;
Table 3: Obstetric, gynaecologic and biomedical characteristics of study participants

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Frequency (n=367)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiparous</td>
<td>231</td>
<td>63</td>
</tr>
<tr>
<td>Primigravidae</td>
<td>136</td>
<td>37</td>
</tr>
<tr>
<td><strong>Weeks of amenorrhoea</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First trimester (0-13 weeks)</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Second trimester (14-26 weeks)</td>
<td>105</td>
<td>29</td>
</tr>
<tr>
<td>Third trimester (27-40 weeks)</td>
<td>257</td>
<td>70</td>
</tr>
<tr>
<td><strong>Planned pregnancy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>298</td>
<td>81</td>
</tr>
<tr>
<td>No</td>
<td>69</td>
<td>19</td>
</tr>
<tr>
<td><strong>Complications during current pregnancy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>330</td>
<td>90</td>
</tr>
<tr>
<td>Yes</td>
<td>37</td>
<td>10</td>
</tr>
<tr>
<td><strong>Mode of delivery in previous delivery</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal vaginal delivery</td>
<td>140</td>
<td>61</td>
</tr>
<tr>
<td>Assisted/Caesarean</td>
<td>91</td>
<td>39</td>
</tr>
<tr>
<td><strong>No of Caesarean Sections</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;2</td>
<td>57</td>
<td>64</td>
</tr>
<tr>
<td>&gt;=2</td>
<td>32</td>
<td>36</td>
</tr>
<tr>
<td><strong>History of mental illness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>No</td>
<td>365</td>
<td>99</td>
</tr>
<tr>
<td><strong>Relative known to have mental illness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>No</td>
<td>351</td>
<td>96</td>
</tr>
</tbody>
</table>
4.5 Factors associated with depression among pregnant women:

The factors associated with depression are explained by the socio-demographic and economic factors, the biomedical/behavioral factors and the gynecological/obstetric factors.

**Socio-demographic factors;**

Table 4 shows the bivariate analysis for the socio-demographic factors associated with depression in pregnant women. The factors that were significantly associated with depression were: age < 20 years (p-value < 0.001), being a victim of violence (p-value=0.002), no family support (p-value=0.032) among others as shown in the table 4.
Table 4: Bivariate analysis of socio-demographic factors associated with depression

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Depressed (n=17)</th>
<th>Not Depressed (n=350)</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Women’s’ age in years</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>26.5 ± 7.1</td>
<td>26.3 ± 0.3</td>
<td>0.002</td>
</tr>
<tr>
<td><strong>Years spent in marriage</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>8 ± 5.5</td>
<td>4.9 ± 4.1</td>
<td>0.004</td>
</tr>
<tr>
<td><strong>Women’s’ age in years</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>5 (29)</td>
<td>24 (7)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>20-34</td>
<td>8 (47)</td>
<td>301 (86)</td>
<td></td>
</tr>
<tr>
<td>&gt;34</td>
<td>4 (24)</td>
<td>25 (7)</td>
<td></td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married/cohabiting</td>
<td>11 (65)</td>
<td>299 (85)</td>
<td>0.021</td>
</tr>
<tr>
<td>Separated/divorced/single</td>
<td>6 (35)</td>
<td>51 (15)</td>
<td></td>
</tr>
<tr>
<td><strong>Relationship status with spouse</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>8 (47)</td>
<td>294 (84)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Not good</td>
<td>9 (53)</td>
<td>56 (16)</td>
<td></td>
</tr>
<tr>
<td><strong>Support received</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10 (59)</td>
<td>117 (33)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>7 (41)</td>
<td>233 (67)</td>
<td>0.032</td>
</tr>
<tr>
<td><strong>Ever been a victim of domestic violence</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10 (59)</td>
<td>105 (30)</td>
<td>0.021</td>
</tr>
<tr>
<td>No</td>
<td>7 (41)</td>
<td>245 (70)</td>
<td></td>
</tr>
</tbody>
</table>

*p-value* for a chi-squared test for the categorical variables and the t-test for continuous variables

**SD:** means standard deviation
Socio-economic and behavioural factors;

Table 5 shows the bivariate analysis for the socio-economic and behavioural factors associated with depression in pregnant women. The factors that were significantly associated with depression were: level of education; primary and below (p = 0.057), and number of meals; one meal or none (p = 0.196). The rest are as shown in the table below;

Table 5: Bivariate analysis of socio-economic factors associated with depression

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Depressed (n=17)</th>
<th>Not Depressed (n=350)</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level of education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>primary and below</td>
<td>15 (88)</td>
<td>231 (66)</td>
<td>0.057</td>
</tr>
<tr>
<td>secondary and tertiary</td>
<td>2 (12)</td>
<td>119 (34)</td>
<td></td>
</tr>
<tr>
<td><strong>Participants’ monthly earning (Ugshs.)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\leq$200,000</td>
<td>5 (29)</td>
<td>100 (29)</td>
<td>0.342</td>
</tr>
<tr>
<td>$&gt;200,000</td>
<td>2 (12)</td>
<td>94 (27)</td>
<td></td>
</tr>
<tr>
<td>No income</td>
<td>10 (59)</td>
<td>156 (45)</td>
<td></td>
</tr>
<tr>
<td><strong>Partner’s earning (Ugshs.)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\leq$500,000</td>
<td>6 (38)</td>
<td>116 (33)</td>
<td>0.588</td>
</tr>
<tr>
<td>$&gt;500,000</td>
<td>1 (6)</td>
<td>55 (16)</td>
<td></td>
</tr>
<tr>
<td>Do not know</td>
<td>9 (56)</td>
<td>179 (51)</td>
<td></td>
</tr>
<tr>
<td><strong>Major meals per day</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\leq$One meal</td>
<td>2 (12)</td>
<td>12 (3)</td>
<td>0.196</td>
</tr>
<tr>
<td>(Two meals)</td>
<td>7 (41)</td>
<td>138 (39)</td>
<td></td>
</tr>
<tr>
<td>(Three meals)</td>
<td>8 (47)</td>
<td>200 (57)</td>
<td></td>
</tr>
<tr>
<td><strong>Alcohol consumption</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1 (6)</td>
<td>24 (7)</td>
<td>0.876</td>
</tr>
<tr>
<td>No</td>
<td>16 (94)</td>
<td>326 (93)</td>
<td></td>
</tr>
</tbody>
</table>

*p-value for a chi-squared test for the categorical variables
Obstetric, gynaecologic and biomedical factors associated with depression:

Table 6 shows the bivariate analysis for the obstetric, gynaecologic and biomedical factors associated with depression in pregnant women. The factors that were significantly associated with depression were: planned/unplanned pregnancy ($p = 0.002$), and complications during pregnancy ($p = 0.059$). The rest are as shown in the table below;

**Table 6: Bivariate analysis of Obstetrics, gynaecologic and biomedical Factors associated with depression:**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Depressed (n=17)</th>
<th>Not Depressed (n=350)</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiparous</td>
<td>11 (65)</td>
<td>220 (63)</td>
<td>0.878</td>
</tr>
<tr>
<td>Primigravidae</td>
<td>6 (35)</td>
<td>130 (37)</td>
<td></td>
</tr>
<tr>
<td><strong>Weeks of amenorrhea</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First trimester (0-13 weeks)</td>
<td>0</td>
<td>5 (2)</td>
<td>0.502</td>
</tr>
<tr>
<td>Second trimester (14-26 weeks)</td>
<td>3 (18)</td>
<td>102 (29)</td>
<td></td>
</tr>
<tr>
<td>Third trimester (27-40 weeks)</td>
<td>14 (82)</td>
<td>243 (69)</td>
<td></td>
</tr>
<tr>
<td><strong>Planned pregnancy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9 (53)</td>
<td>289 (83)</td>
<td><strong>0.002</strong></td>
</tr>
<tr>
<td>No</td>
<td>8 (47)</td>
<td>61 (17)</td>
<td></td>
</tr>
<tr>
<td><strong>Complications (current pregnancy)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>13 (76)</td>
<td>317 (91)</td>
<td><strong>0.059</strong></td>
</tr>
<tr>
<td>Yes</td>
<td>4 (24)</td>
<td>33 (9)</td>
<td></td>
</tr>
<tr>
<td><strong>Mode of delivery (previous delivery)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal vaginal delivery</td>
<td>6 (55)</td>
<td>134 (61)</td>
<td>0.673</td>
</tr>
<tr>
<td>Assisted/Caeserean</td>
<td>5 (45)</td>
<td>86 (39)</td>
<td></td>
</tr>
<tr>
<td><strong>No of Caesarean Sections</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;2</td>
<td>3 (60)</td>
<td>54 (64)</td>
<td>0.846</td>
</tr>
<tr>
<td>&gt;=2</td>
<td>2 (40)</td>
<td>30 (36)</td>
<td></td>
</tr>
<tr>
<td><strong>History of mental illness</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
<td>2 (1)</td>
<td>0.755</td>
</tr>
<tr>
<td>No</td>
<td>17 (100)</td>
<td>348 (99)</td>
<td></td>
</tr>
<tr>
<td><strong>Relative known to have mental illness</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1 (6)</td>
<td>15 (4)</td>
<td>0.753</td>
</tr>
<tr>
<td>No</td>
<td>16 (94)</td>
<td>335 (96)</td>
<td></td>
</tr>
</tbody>
</table>

*p-value* for a chi-squared test for the categorical variables
4.6 Multivariate analysis for the factors associated with depression among pregnant women

The factors that were significantly associated with depression among pregnant women included; young age i.e. <20 years (p-value=0.018), and advanced maternal age, >34 years (p-value=0.049). Other factors were not statistically significant.

Table 7: Multivariate analysis of Factors associated with depression in pregnant women in Mulago Hospital.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Odds ratios</th>
<th>95% CI</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women’s’ age in years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>0.17</td>
<td>(0.04 - 0.74)</td>
<td>0.018</td>
</tr>
<tr>
<td>20-34</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;34</td>
<td>0.26</td>
<td>(0.07 - 0.10)</td>
<td>0.049</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>married/cohabiting</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>separated/divorced</td>
<td>0.64</td>
<td>(0.16 - 2.44)</td>
<td>0.51</td>
</tr>
<tr>
<td>Relationship status with spouse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not good</td>
<td>0.54</td>
<td>(0.14 - 2.03)</td>
<td>0.364</td>
</tr>
<tr>
<td>Family Support received</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.41</td>
<td>(0.44 - 4.55)</td>
<td>0.567</td>
</tr>
<tr>
<td>History of domestic violence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.39</td>
<td>(0.11 - 1.42)</td>
<td>0.154</td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planned pregnancy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0.48</td>
<td>(0.15 - 1.47)</td>
<td>0.197</td>
</tr>
</tbody>
</table>

*p-value with statistically significant values (p-value<0.05)
CHAPTER FIVE

5.0 DISCUSSION:

This study was conducted to determine the prevalence and factors associated with depression in pregnant women at Mulago hospital in Uganda. As shown by scores of 13 and above on EPDS 17(5%) had depression as. Five participants out of the 17 had major depression as diagnosed by DSM V. This translated into 29.41% of the depressed. Teenage pregnancy and advanced maternal age (>34 years) during pregnancy were independently associated with depression in pregnancy.

5.1 Prevalence of depression among pregnant women:

The prevalence of depression among pregnant women at Mulago National Referral and Teaching Hospital was 5%, a figure that is within the estimated prevalence of 4-17% in Africa[61].

A study conducted in Tanzania in 2010 showed a prevalence of 39.5%; almost eight times the prevalence found in this study[15]. A similar study done in Ethiopia in 2015 also showed a higher prevalence of 24.94%[16], in South Africa KwaZulu Natal in 2012 38.5%[79] and Ghana in 2014; 9.9%[17]. These studies from the neighbouring countries were done among rural populations; on the contrary this study was done in an urban setting. This could explain their higher prevalence rates compared to the 5% obtained in this study. Rural residents are more likely than their urban peers to experience circumstances, conditions and behavior that challenge health and may increase the prevalence of depression. Rural residents are more likely to live in poverty than urban residents; poverty is associated with more morbidity hence they are at a higher risk of getting depression [93].
The disparity between prevalence of depression in pregnancy in Mulago National Referral and Teaching Hospital and the rest of the African countries mentioned above could also in part be explained by methodological differences among studies and different measurement tools across these countries e.g. in Tanzania where the prevalence was 39.5%, they used a different tool Hopkins Symptom Checklist as opposed to Edinburgh Postnatal Depression Scale[15].

Furthermore different studies use different cut offs on EPDS to assess for depression, a number of studies use a lower cut off of 10. A study done in 2001 in Thailand which showed a prevalence of 20.5% for ante partum depression used a score of 10 and above on EPDS to diagnose depression[94]. Another study by Larsson in 2004 also used the same cut off to diagnose depression and gave a prevalence of 15%[95]. In this study depression was defined by a score of 13 and above on EPDS, this could also possibly explain the relatively lower prevalence of 5%.

The other possible explanation for the relatively low prevalence of 5% for ante partum depression in this study compared to the neighbouring countries would be the fact that only 37% of the study participants were primigravidae; the rest 63% were multiparous. Risk for depression has been shown to be higher in primigravidae women due to inexperience of mothers coupled with fear of child birth leading to psychological maladjustment; furthermore since they have not experienced a previous pregnancy, they may feel insecure[84, 87]

It is also important to consider the possibility of socio-cultural factors which play a role in shaping up the motherhood experience in contemporary Uganda society[96].
Traditional values and customs; propagation of family lineage are highly regarded and celebrated in our setting; hence pregnancy is regarded as a period of joy and the women are generally given a lot of care and attention by family members, relatives and close friends hence relatively low predisposition to depression[96].

5.2 Factors associated with depression among pregnant women:

In this study, the factors that had statistical significant association with depression among pregnant women in Mulago National Referral and Teaching Hospital were pregnancy in less than 20 year olds (teenage pregnancy) and advanced age ( >34 years).

A study by Tadesse et al 2016 found that the risk of depression for women between 14-19 years was 82% higher than those between 20-29 years[97], A similar finding was reported in a study done in Nigeria in 1994[98] and another done in periurban South African setting in 2011[78]; a finding that was consistent with this study which established a significant association between teenage pregnancy and ante partum depression.

These people being young develop depression because of the responsibilities that accompany child bearing and obstetric complications associated with young age. A large number may lack support, stigma that is attached to teenage pregnancy among other factors may predispose them to depression[97].

In UDHS 2016, the age of childbearing is early with 25% of adolescents aged 15-19 years already mothers, hence the finding of this study could be an eye opener to a bigger problem among this age group bearing in mind that the youth form a large proportion of Uganda population.
It has also been shown in studies that in many parts of Sub-Saharan Africa, the majority of pregnancies among adolescents aged nineteen years and below result from unplanned and unprotected sexual acts and are therefore mostly unintended[99-101]. This puts them at a higher risk for ante partum depression.

This study also demonstrated a significant independent association between advanced maternal age during pregnancy and ante partum depression. Studies have associated the age of thirty five years and above with multiple obstetric morbidities (gestational diabetes, ante partum haemorrhage, pregnancy induced hypertension and psychological stress) and poor maternal fetal outcomes[102].

Most of the women with advanced age either have secondary or tertiary education hence likely to be concerned with the possibility of miscarriage, the physical demands of caring for newborn especially those who are primigravidae, they are also concerned about the possibility of giving birth to a foetus with structural or chromosomal abnormalities[102].

A cross sectional study done in Finland where population based analysis was done between 2002 to 2010 showed a significant association between advanced maternal age (>35 years) and ante partum depression[103]. This is also supported by another study done in Norway in 2012 which showed significant association between advanced age and ante partum and postpartum depression, a situation that was worsened by primiparity [104].

The other factors were not significantly associated with ante partum depression in this study ; marital status, gestational age, family history of mental illness, unplanned pregnancy, previous
abortion, mode of delivery, level of education, number of meals per day, complications during pregnancy and alcohol intake and substance use.

A study in Ethiopia in 2016 however found a significant association between parity and depression in pregnancy; primigravidae were five times at higher risk of being depressed than those with at least two number of previous pregnancies[105]; another study of 2009 in Ethiopia showed a similar result[106], in this study( Mulago Hospital), the insignificant association could probably be attributed to the fact that majority (63%) of the participants were multiparous..

The same study in Ethiopia in 2016 did not find significant association among income, substance abuse, domestic violence, unplanned pregnancy and ante natal depression; findings that are consistent with this study [97].

However a study in Ghana 2014 found a strong and independent association between unplanned pregnancy and ante partum depression ; which highlights the important role of decision making on mental well being in a predominantly patriarchial population where women usually have limited involvement in decision making regarding reproductive health[17].

A study by Hanna et al in 1994 found a significant link between ante partum depression and adverse events/or outcomes during current pregnancy, for both mother and foetus[6].

However a systematic review done in 2010 failed to show a significant association between complications during pregnancy and ante partum depression both at bivariate and multivariate analyses[107]. Afinding consistent with this study.
A systematic review of 2010 on ante partum depression found a significant association of the following factors; lack of family support and domestic violence. History of abuse within the past year was associated with almost 2.5 times the odds of a positive screen for depression[107].

A study in Brazil 2013 showed that pregnant women who had suffered domestic violence in the past were 4.41 times more likely to experience depression during pregnancy than those without this history[108].

The findings of this study conducted at ANC, Mulago National Referral and Teaching Hospital and the findings of the other studies mentioned in the literature review and discussion highlights the importance of routine ante natal screening for depression in primary health care given that ante natal depression is already known to negatively impact on the uptake of antenatal care as well as on foetal and obstetric outcomes and is a strong predictor of postnatal depression[109].

Furthermore Birndorf et al in 2001 showed that a few pregnant women disclose their emotional problems willingly to health workers who also rarely recognize these problems. This also emphasizes the need for routine screening for symptoms of depression and its associated risk factors and continuous counseling for pregnant women in Mulago Hospital[110].
CHAPTER SIX

6.0 Strengths of the Study:

Research assistants were trained prior to commencement of the study hence were familiar with the research tools and issues of confidentiality regarding data collection; this helped to reduce errors during data collection and ensured acquisition of accurate information from study participants. Systematic sampling was used to recruit participants; this helped to eliminate selection bias.

The tools used to determine prevalence of depression of ante partum depression in this study are universally accepted in the field of psychiatric research; DSM V is a standard tool used worldwide for diagnosis of major depressive disorder. EPDS is used worldwide to assess for depression both in ante partum and post partum periods; participants who score 13 and above are categorized as depressed[92].

6.1 Study Limitations:

Pregnant women who were too ill to respond to the interviewer administered questionnaire or those who needed urgent attention like those with severe anaemia, eclampsia, ante partum haemorrhage and other severe illnesses were excluded from the study to enable them access the necessary care as soon as possible. However, this may have lowered the prevalence of depression in this study since these people would be at a higher risk of depression.
Pregnant women who presented with lack of insight hence unable to respond to the interviewer administered questionnaire were excluded from the study yet some of them could have superimposed depressive symptoms.

It was difficult to make causal inference of ante partum depression at that point in time since it was a cross sectional study, which could only show whether there was a significant association among the factors investigated and ante partum depression.

In addition, talking about psychological and social issues was emotional to some clients. However, the team was prepared to address these issues and the participants with major depressive disorder were linked to mental health care.

### 6.2 Conclusion:

The prevalence of depression of 5% was consistent with the prevalence of 4-17% in Africa [61]. 1.4% had major depression which translated to 29.41% of those who were depressed. Pregnancy at younger age (less than 20 years) and advanced maternal age had significant association with ante partum depression. Hence there is need to integrate mental health care with antenatal and postnatal care for women in the reproductive age group.

### 6.3 Recommendations

The health policy makers and advocates need to review the ANC package and consider incorporating screening for depression in antenatal programs for all women and providing practical support to women during pregnancy. They could start by screening all pregnant teenagers and all women with advanced maternal age as these two factors had significant
association with ante partum depression in this study. The study indicates the necessity of integrating mental health with existing maternal and child health programs to ensure the health of both mother and baby.

Labour and delivery need to be managed by skilled staff in order to prevent complications after delivery. Improve policies that involve men in safe motherhood programs in order to support women physically, financially and all other aspects of life.

There is also need to do a similar study in a rural setting and compare the outcome with the prevalence obtained in this study which was done in an urban setting.

Studies to be directed towards risk factors and outcomes of depression among pregnant women in Uganda are required in order to help in developing effective interventions that are suitable for integration into primary health care in Uganda and other developing countries.
REFERENCES


4. Diagnostic and Statistical Manual. 5.


APPENDIX I:

CONSENT FOR THE STUDY.

INFORMATION TO RESPONDENTS

STUDY TITLE: PREVALENCE AND FACTORS ASSOCIATED WITH DEPRESSION IN PREGNANT WOMEN AT MULAGO HOSPITAL, UGANDA

Investigator: Dr. Ndege O. Jared, Senior House Officer, department of obstetrics and gynaecology, Makerere University.

Purpose of the study: To determine the prevalence and factors associated with depression in pregnancy. The findings will give an insight to health policy makers to enable them come up with a mental health package that will ensure delivery of comprehensive ANC services and subsequently improve antenatal services for you and other patients in Mulago and the rest of the country.

Study Procedure: If you choose to participate in the study, you will voluntarily sign an informed consent form thereafter you will be asked questions regarding the current and previous pregnancies if any, the kind of social support network you have at home, socio economic status and any behavioural factors such as drug use or abuse which may affect your psychosocial wellbeing and the pregnancy. The study is envisaged to last three months.

Risks: There are minimal risks expected during this study, like talking about psychological issues may be emotional to some clients. But we will try to minimize these risks

Rights: You have a right to decline to participate in the study or withdraw from it at any stage of questioning without affecting the antenatal services or any other care offered to you while you are in hospital.
**Confidentiality:** All your responses will be kept confidential. Your identity will not be revealed but information collected will be seen by those involved in this study.

**Benefits:** There are no direct benefits to you but the information gathered will help us to improve the antenatal services including the mental health care of pregnant women.

**Cost and Compensation:** There is no cost or payment to you during the study.

If you have any questions about this study, you are free to ask now.

**Emancipated minors:** Clients who are less than 18 years or whose caretakers are minors will be treated as emancipated minors.

**In case of questions:** If you have any questions you can contact the investigator, Dr Ndege O. Jared, department of Obstetrics and Gynaecology, Mulago hospital P.O. Box 7051 Kampala, Uganda.

Mobile: +256778967801

If you have questions about your rights as a research participant, you can have your concerns addressed to the chairman school of Medicine Ethics review board, **Associate Prof. Ocama Ponciano** on +256772421190
CONSENT FORM.

STATEMENT OF CONSENT

I the undersigned acknowledge that the principal investigator/the research assistant has fully explained to me the nature, purpose and procedures involved in this study. I appreciate that participation is completely voluntary, that my refusal or withdrawal from this study will not in any way affect any medical service or medical advice I may need now and in the future. I therefore sign here as proof of my consent for participating in this study.

Name........................................................................................................

Signature or Right thumb imprint............................................................

Date...........................................................................................................

Signature of witness ..............................................................................

I have explained to the best of my knowledge the purpose of this study to the participant and her consent has been without force or coercion. I have given the participant enough time to understand what the study is about in a language she is well versed with. I also acknowledge that I have given her an opportunity to ask questions for clarity.

Name of person obtaining consent...........................................................

Signature ................................................................................................

Date.........................................................................................................
APPENDIX II: DSM V ON MAJOR DEPRESSIVE DISORDER.

Diagnostic Criteria

A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning: at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure.

Note: Do not include symptoms that are clearly attributable to another medical condition.

1. Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad, empty, hopeless) or observation made by others (e.g., appears tearful). (Note: In children and adolescents, can be irritable mood.)

2. Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation).

3. Significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. (Note: In children, consider failure to make expected weight gain.)

4. Insomnia or hypersomnia nearly every day.

5. Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down).

6. Fatigue or loss of energy nearly every day.

7. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick).

8. Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others).
9. Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide.

B. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

C. The episode is not attributable to the physiological effects of a substance or to another medical condition.

Note: Criteria A-C represent a major depressive episode.

Note: Responses to a significant loss (e.g., bereavement, financial ruin, losses from a natural disaster, a serious medical illness or disability) may include the feelings of intense sadness, rumination about the loss, insomnia, poor appetite, and weight loss noted in Criterion A, which may resemble a depressive episode. Although such symptoms may be understandable or considered appropriate to the loss, the presence of a major depressive episode in addition to the normal response to a significant loss should also be carefully considered. This decision inevitably requires the exercise of clinical judgment based on the individual’s history and the cultural norms for the expression of distress in the context of loss.^

D. The occurrence of the major depressive episode is not better explained by schizoaffective disorder, schizophrenia, schizophreniform disorder, delusional disorder, or other specified and unspecified schizophrenia spectrum and other psychotic disorders.

E. There has never been a manic episode or a hypomanic episode.

Note: This exclusion does not apply if all of the manic-like or hypomanic-like episodes are substance-induced or are attributable to the physiological effects of another medical condition.
APPENDIX III: EDINBURGH POSTNATAL DEPRESSION SCALE

Today’s Date: ............................  Weeks pregnant: .................................

Study ID..................................

TOTAL SCORE.......................  

INSTRUCTIONS

Please tick one of the options for each question that is the closest to how you have felt in the

PAST SEVEN DAYS.

1. I have been able to laugh and see the funny

side of things:

{ As much as I always could [3]

{ Not quite as much now [2]

{ Definitely not so much now [1]

{ Not at all [0]

2. I have looked forward with enjoyment to

things:

{ As much as I ever did [0]

{ Rather less than I used to [1]

{ Definitely less than I used to [2]

{ Hardly at all [3]
3. I have blamed myself unnecessarily when things went wrong:
   { Yes, most of the time [3]
   { Yes, some of the time [2]
   { Not very often [2]
   { No, never [0]

4. I have been anxious or worried for no good reason:
   { No, not at all [0]
   { Hardly ever [1]
   { Yes, sometimes [2]
   { Yes, very often [3]

5. I have felt scared or panicky for no very good reason:
   { Yes, quite often [3]
   { Sometimes [2]
   { Hardly ever [1]
   { Never [0]

6. Things have been getting on top of me:
   { Yes, most of the time I haven’t been able to cope at all [3]
   { Yes, sometimes I haven’t been coping as well as usual [2]
   { No, most of the time I have coped quite well [1]
7. I have been so unhappy that I have had difficulty sleeping:

{ Yes, most of the time [3]
{ Yes, sometimes [2]
{ Not very often [1]
{ No, not at all [0]

8. I have felt sad or miserable:

{ Yes, most of the time [3]
{ Yes, quite often [2]
{ Not very often [1]
{ No, not at all [0]

9. I have been so unhappy that I have been crying:

{ Yes, most of the time [3]
{ Yes, quite often [2]
{ Only occasionally [1]
{ No, never [0]

10. The thought of harming myself has occurred to me:

{ Yes, quite a lot [3]
{ Yes, sometimes [2]
{ No, not much [1]
{ No, not at all [0]

NB: If you have had ANY thoughts of harming yourself, please tell your GP/Midwife.

**Range of EPDS Scores**

**Scores**

**0-9**: Scores in this range may indicate the presence of some symptoms of distress that may be short-lived and are less likely to interfere with day to day ability to function at home or at work. However if these symptoms have persisted more than a week or two further enquiry is warranted.

**10-12**: Scores within this range indicate presence of symptoms of distress that may be discomforting. Repeat the EDS in 2 weeks time and continue monitoring progress regularly. If the scores increase to above 12 assess further and consider referral as needed.

**13+**: Scores above 12 require further assessment and appropriate management as the likelihood of depression is high. Referral to a psychiatrist/psychologist may be necessary.

Item 10: Any woman who scores 1, 2 or 3 on item 10 requires further evaluation before leaving the office to ensure her own safety and that of her baby.
APPENDIX IV: QUESTIONNAIRE FOR PARTICIPANTS

Instructions:

Please provide an honest appropriate answer to all the questions you will be asked below.

Study No......................  Clinic No......................

Telephone contact...............  Date......................

Tribe........................................

Address  □1= Kampala  □2= Wakiso  □3= others specify.........................

Fill in or circle one of the following options as provided by the participant.

Socio-demographic information

1. How old are you?..........................Years

2. What is your marital status?
   □1=Single
   □2=Married
   □3=Cohabiting
   □4=Separated/divorced

3. How long have you been married in years? ..................................................

4. How is the relationship with your spouse?
   □1= Good
   □2= Fair
   □3= bad
5. Have you received support (e.g. physical, emotional, financial) from your family during this pregnancy?
   - 1=No
   - 2=some times
   - 3=all the time

6. Have you ever been a victim of the following?
   - 1=physical assault
   - 2=verbal assault
   - 3=sexual assault
   - 4=All the above
   - 5=None of the above
   - 6=other specify………………………………

**Economic factors:**

7. What is your level of education?
   - 1=No formal education
   - 2= Lower primary (p1-p4)
   - 3=Higher primary (p5-p7) S
   - 4=O level (S1-S4)
   - 5=A level (S5-S6)
   - 6=Tertiary

8. How much do you earn per month in UGX? ………..
9. How much does your partner earn per month in UGX?

- □ 1=0 - 50,000/=  
- □ 2= 50,001 - 100,000/=  
- □ 3=100,001 - 200,000/=  
- □ 4=200,001 - 500,000/=  
- □ 5=>500,001/=  
- □ 6=I don’t know

10. How many major meals do you have in a day?

- □ 1=≤ one meal  
- □ 2=Two meals  
- □ 3=> three meals

**Behavioral factors**

11. Have you been taking alcohol during this pregnancy?

- □ 1=Yes  
- □ 2=No  

If yes, how often do you take alcohol?

- □ 1=Daily  
- □ 2=Weekly  
- □ 3=Monthly  
- □ 4=Occasional

Which brand………………..

How many times do you take alcohol? .........................

How much alcohol do you take? ...............................Liters

12. Have you been smoking during this pregnancy?

- □ 1= Yes  
- □ 2= No
13. Do you use any other substance of abuse? Yes

No

If the yes, which one? .................

How often do you use it? ............. 1-Daily 2-Weekly 3-Monthly 4-Occasional

**Biomedical factor**

Ask about the following;

Parity............... 

14.  a) LNMP……./…../……..b) Weeks of amenorrhea (WOA)............... 

15.  Did you plan to have this pregnancy?

   □1=yes, I did
   □2=No, it just happened
   □3=No, I was forced
   □4=No, I was raped
   □5=others specify…………………….....

(For a primi gravida, skip questions 17, 18, 19, 20, 21, 22)

16. How many of your children are alive? .................................................................

17. Number of previous abortions.................................................................

18. Have you ever gotten any of the following complications while pregnant?

   High blood pressure □1=yes □2=No

   Fits/convulsions □1=yes □2=No

       Bleeding while pregnant at ≥ 7 months of pregnancy □1=yes □2=No

       Labor/ rupture of membranes before 37 completed WOA □1=yes □2=No

   Others (specify) .................................................................
19. What mode of delivery did you have for the previous pregnancies?

- □ 1 = Caesarean section only
- □ 2 = Spontaneous vaginal delivery only
- □ 3 = Assisted vaginal delivery (like Vacuum extraction, Forceps delivery, assisted breech delivery, etc)
- □ 4 = Some were by vaginal delivery and others by caesarean section.

20. If by caesarean section, how many have you undergone?

- □ 1 = 1
- □ 2 = 2
- □ 3 = 3 or more

21. Did you experience any of the following complications after delivery?

- Excessive per vaginal bleeding □ 1 = yes □ 2 = no
- Blood transfusion □ 1 = yes □ 2 = no
- Fever and/or pus discharge from the vagina □ 1 = yes □ 2 = no
- Pain and/or swelling around the nipples □ 1 = yes □ 2 = no
- Others (specify) ............................................

22. Do you have any history of mental illness?

- □ 1 = Yes
- □ 2 = No

23. If yes to question 23, are you taking medication for your mental illness?

- □ 1 = Yes am taking
- □ 2 = No I have never taken
- □ 3 = I stopped taking
- □ 4 = I don’t know
24. If yes to question 24, which medication are you taking…………………………. (you can use the patient’s medical records if available).

25. Do you have any of your relatives known to have mental illness?

- □ 1=Yes, my parents
- □ 2=No
- □ 3=yes, other relatives
- □ 4= yes, my siblings

26. Do you have history of any of the following chronic diseases?

- Hypertension (High blood pressure) □ 1=yes □ 2=No
- Diabetes (High blood sugar) □ 1=yes □ 2=No
- Asthma □ 1=yes □ 2=No
- Cardiac disease □ 1=yes □ 2=No
- Cancer (specify if known) ……………………… □ 1=yes □ 2=No
- HIV □ 1=yes □ 2=No
- Others (specify) ……………………………………………

27. Have you experienced any of the following symptoms/signs during this pregnancy?

- High blood pressure □ 1=yes □ 2=No If yes, duration………days
- Vaginal bleeding □ 1=yes □ 2=No Duration………………days.
- Fever □ 1=yes □ 2=No Duration………………days
- Cough □ 1=yes □ 2=No Duration………………days
- Other specify………………………… Duration……………..days

29. Do you have any other problem apart from those asked above? .............................
## APPENDIX V: TIME FRAME FOR THE ACTIVITIES:

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September 21, 2017

Dr. Jared Ndege
Department of Obstetrics and Gynaecology

Dear Dr. Ndege,

Re: Approval of proposal #REC REF 2017-113

"Prevalence and factors associated with depression in pregnancy in Mulago hospital"

Thank you for submitting an application for approval of the above – referenced proposal. The committee reviewed it and granted approval for one year, effective September 21st, 2017. Approval will expire on September 20th, 2018.

Continuing Review
In order to continue work on this study (including data analysis) beyond the expiration date, the School of Medicine Research and Ethics Committee must reapprove the protocol after conducting a substantive, meaningful, continuing review. This means that you must submit a continuing report form as a request for continuing review. To best avoid a lapse, you should submit the request six (6) to eight (8) weeks before the lapse date. Please use the forms supplied by our office.

Amendments
During the approval period, if you propose any change to the protocol such as its funding source, recruiting materials, or consent documents, you must seek School of Medicine Research and Ethics Committee approval before implementing it.
Please summarize the proposed change and the rationale for it in a letter to the School of Medicine Research and Ethics Committee. In addition, submit three (3) copies of an updated version of your original protocol application- one showing all proposed changes in bold or ‘track changes,’ and the other without bold or track changes.
Reporting
Other events which must be reported promptly in writing to the School of Medicine Research and Ethics Committee include: Suspension or termination of the protocol by you or the grantor. Unexpected problems involving risk to participants or others.

Adverse events, including unanticipated or anticipated but severe physical harm to participants.

Do not hesitate to contact us if you have any questions. Thank you for your cooperation and commitment to the protection of human subjects in research.

Final approval is to be granted by Uganda National Council for Science and Technology.

Documents approved for use along with protocol:
- English and translated informed consent forms
- Data collection tool

Yours sincerely,

Assoc. Prof Joan Kalyango
Vice Chairperson School of Medicine Research and Ethics Committee