Prevalence of Antenatal Depression and Associated Risk Factors among Pregnant Women Attending Antenatal Clinics in Abeokuta North Local Government Area, Ogun State.

BY

Thompson Okechukwu

MBBS (ABSU, 2007)

Matric:183200

A dissertation submitted in partial fulfillment of the requirement for the degree of Masters in Public Health, in the Department of Epidemiology and Medical Statistics, University of Ibadan, Nigeria

January 2016

CERTIFICATION

I certify that this work "Prevalence of Antenatal Depression and Associated Risk Factors among Pregnant Women Attending Antenatal Clinics in Abeokuta North Local Government Area, Ogun State" was carried out by Thompson, Okechukwu under my supervision in the Department of Epidemiology and Medical Statistics, Faculty of Public Health, College of Medicine, University of Ibadan, Nigeria

.....13/06/2016.....

Dr. IkeOluwapo Ajayi, M.B., B.S, M.C.L.Sc, MPH, Ph.D, Cert, Field Epid, FMCGP, FWACP

Reader, Department of Epidemiology and Medical Statistics

College of Medicine,

University of Ibadan.

ATTESTATION

I attest that "Prevalence of Antenatal Depression and Associated Risk Factors among Pregnant Women Attending Antenatal Clinics in Abeokuta North Local Government Area, Ogun State"is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Thompson 13/6/16

.....

Thompson Okechukwu

Department of Epidemiology and Medical Statistics

College of Medicine,

University of Ibadan

DEDICATION

This study is dedicated to my wife Magdalene Thompson, and our daughter Chidiamara Thompson.

ACKNOWLEDGEMENTS

First and foremost I extend my gratitude to God for protecting me throughout the period of my research in Abeokuta and for granting me the courage and strength to accomplish this study even when I lost hope and determination.

I am specially grateful to my supervisor, Dr IkeOluwapo Ajayi, for her patience and commitment to share her experience and knowledge with me during my research. Her guidance and thoroughness will always be acknowledged with respect and appreciation. I also thank Dr A.T. Salawu for his invaluable support he offered to me during my research.

I would like to thank my lecturers for their guidance and support during my studies. The support of my friends and colleagues through sharing time and ideas during the study period is worth commending.

My sincere appreciation goes to staff and managements of Korede Hospital, Kugba, Morab Hospital, Adedotun, Olabisi Onabanjo Universith Teaching Hospital, Saje Annex, Eweje Maternity Clinic, Abeokuta, Holy Mary Maternity Clinic Abeokuta, Oluseyi Maternity Clinic, Abeokuta, Iberekodo Primary Health Center, Abeokuta and Keesi Primary Health Center, Abeokuta , for their assistance they provided me during my research.

I would like to thank my wife and daughter for their unconditional love and support; this has played a fundamental role in the successful completion of this research. Many thanks go to my family for their prayers, support and much needed encouragement throughout the time devoted for my Master's degree. I thank them for accommodating me during this time and for seeing me through it.

ABSTRACT

Introduction: Antenatal depression is increasingly being recognized as an important public health issue. According to WHO, depression is a common mental illness which is ranked the third most prevalent moderate and severe disabling condition globally. Depression in pregnancy has been associated with somatic symptoms such as headache, abdominal pain, shortness of breath, palpitation and dizziness which have been associated with increased healthcare utilization, functional impairment and absenteeism from work. It has been associated with preterm, post-neonatal deaths, prolonged labour and non-vaginal delivery. This study was aimed at determining the prevalence of Antenatal Depression and Associated Risk Factors among Pregnant Women Attending Antenatal Clinics in Abeokuta North Local Government Area, Ogun State. .It identified most prevalent predictors of antenatal depression among pregnant women in Abeokuta North LGA and prevalence of antenatal depression in each trimester.

Methods: A descriptive quantitative cross-sectional survey was conducted, interviewing a sample of 314 pregnant women, who were selected by multi-stage cluster sampling technique. Information on demographics and factors associated with antenatal depression were collected using structured questionnaire, and a screening tool Edinburgh Postnatal Depression Scale (EPDS) was used to collect information on women to assess probable depression. Data were analysed using descriptive statistics such as mean, standard deviation and proportions to summarise the data. Chi square and student t-test were used to test association between categorical and means of continuous variables, respectively. Multivariable analysis was performed to determine independent predictors of antenatal depression. Level of significance was set at 5%.

Results: Mean age of respondents was 27.3±5.3 years. Most of the respondents were aged 21-35 years (82%); Yoruba (98.1%); married (93%); traders (55.9%). In addition, 78.5% were from a monogamous family; 50.6% had secondary school level of education and 68.9% had small family size (1-4 persons). Prevalence of antenatal depression was 24.5%. In terms of gestational age of pregnancy, prevalence of antenatal depression was 27.5%, 25% and 23.5% in first, second and third trimesters, respectively. There were significant associations between antenatal depression and attending public health facility (p=0.000),young maternal age (p=0.012), single marital status (p=0.010), no formal education (p=0.022),large family size (p=0.029), planned

pregnancy (p=0.014), co-existing medical conditions (p=0.034), and history of previous caesarian section (p=0.032).There were significant associations between antenatal depression and drinking alcohol during pregnancy (p=0.004) and gender based abuse and (p=0.001). On health-seeking behaviour for antenatal depression among depressed pregnant women, most, 68.9%, consulted their husbands about symptoms of antenatal depression; most,57.3%, took decision to get treatment on doctors' information, advice or recommendation; about half, 52%, sought prayer in the church as a form of treatment and some sought treatment in the hospital (41.3%).

Conclusion: Antenatal depression is prevalent in this study population. Interventions to address its associated risk factors such as young age, premarital pregnancy, unplanned pregnancy, history of previous caesarian section, lack of education and co-existing medical condition should be carried out and physicians should suspect depression in pregnant women reporting alcohol use and gender abuse.

Key words: Antenatal clinics, Antenatal Depression, Edinburgh Postnatal Depression Scale (EPDS).

TABLE OF CONTENTS

List of Tables

ABBREVIATIONS

AD: Antenatal depression

ANC: Antenatal Clinic

BDI: Beck Depression Inventory

CBT: Cognitive Behavioural Therapy

CES-D: Center for Epidemiological Studies Depression Scale

CHEW: Community Health Extension Workers

DSM-IV: Diagnostic and Statistical Manual of Mental Disorders, fourth version

E.D.D.: Expected Date of Delivery

EPDS: Edinburgh Postnatal Depression Scale

FGD: Focal Group Discussion

HPA: Hypothalamus-Pituitary-Adrenal Axis

IPT: Interpersonal Psychotherapy

IUGR: Intrauterine Growth Restriction

L.M.P.: Last Menstrual Period

L.G.A.: Local Government Area

MDD: Major Depressive Disorders

MDG: Millenium Development Goals

NDHS: Nigeria Demographic And Health Survey

OOUTH: Olabisi Onabanjo University Teaching Hospital

PRIME-MD, PHQ: Primary Care Evaluation of Mental Disorders Patient Health Questionnaire

SPSS: Statistical Package for Social Sciences

SSRI: Selective Seotonin Re-uptake Inhibitors

SSQN: Social Support Questionnaire Number

SCID-I: Structured Clinical Interview for Axis I disorders

TCA: Tricyclic Antidepressants

WHO: World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background

Depression is a mood disorder which is characterized by prolonged sadness and marked loss of interest in daily activities as core symptoms lasting for one week or more. Other symptoms are numbness, feeling inadequate and worthless, feeling irritable and resentful, insomnia, appetite changes, decreased energy, lack of concentration and poor memory, and thoughts of committing suicide or abortion (NICE, October2009). The National Institute of Health and Care Excellence (NICE) uses the Diagnostic and Statistical Manual Fourth Edition (DSM-IV) to classify depression into subthreshold, mild, moderate and severe depressions. Subthreshold depression has less than five symptoms but there is normal function; mild depression has in excess of five symptoms resulting in minor functional impairment; moderate depression more than five symptoms with moderate functional impairment, and the severe depression presents with most symptoms which markedly interfere with normal functions.

Depression is a common mental illness which is ranked the third most prevalent moderate and severe disabling condition globally by the World Health Organization (WHO, 2004 and 2008). Antenatal depression is a form of clinical depression that can affect a woman during pregnancy, and can be a forerunner to postpartum depression. Risk factors include history of mood or anxiety disorders, history of postnatal depression, history of postmenstrual dysphoric disorder, family history of perinatal psychiatric illness, history of childhood abuse, low income, poor social support, unplanned pregnancy, single motherhood, large number of existing children, domestic violence or relationship conflicts, and young age (Lancaster et al., 2010)

Women have a lifetime risk of about 1 in 8, and it is most prevalent during their reproductive years(Ragg, 2012).The aetiology of depression is unknown, but it is thought that neurobiological and environmental factors combined with genetic predisposition are influential (Ebmeier et a. 1999).

Pregnancy and depression affect each other. Pregnancy is a major psychological, as well as, physiological events. With an excess of chronic life stressors, women may find themselves

unable to cope with the additional demands of pregnancy. Many women, particularly those living in poverty or already with dependent children, may view pregnancy with negative feelings. Issues or memories surrounding poor parenting or abuse women have suffered may reassert themselves and cause distress. Relationships are often under pressure-domestic violence increases during pregnancy (NICE, 2009).

Pregnancy-related sex steroids increase activation of hypothalamic-pituitary-adrenal (HPA) axis which is associated with depression (NICE, 2009). This explains the physiologic aspect of depression in pregnancy. During pregnancy, extensive hormonal changes occur (Chrousos et al., 1998). Corticotrophin Releasing Hormone (CRH) and estradiol regulate HPA axis, causing increased secretion of Glucocorticoid cortisol by the adrenal cortex. Elevated cortisol levels inhibit estradiol synthesis and actions. So, pathogenic low levels of plasma cortisol have been associated with melancholic depression, eating disorder, chronic alcoholism and suicidal tendencies. Target at reduction of HPA activity leads to remission of depression (Holsboer, 2001).

The prevalence of prenatal depression is estimated to be 10-15% in developed countries and 19-25% in economically poorer countries (NICE, 2009). In Nigeria, there is paucity of work done on prenatal depression, but of the few work done one published work shows prevalence of antenatal depression(for third trimester only) to be 8.3% (Abiodun et al.,2006).

1.2 Problem Statement

Depression is one of the most prevalent psychiatric conditions in the community. However, it is neither well recognized nor adequately treated in clinical practice (Tyler, 2000). Multiple reasons exist for this inadequate treatment. Patients fail to recognise the symptoms, underestimate the severity, and are reluctant to seek care. They may be non-compliant with their medications, and financial challenges may prohibit the seeking of medical assistance. Health care providers may have inadequate awareness or education about depression and limited training in that area (Sturm et al., 1995 and Hirschfeld et al., 1997).

Worldwide, antenatal depression has prevalence of 10-15% in developed countries and 19-25% in economically poorer countries (NICE, 2009). It is associated with somatic symptoms, some of which can be debilitating. These are headache, nausea, stomach pain, shortness of breath,

gastrointestinal problems, palpitations, dizziness and sexual dysfunction. These somatic symptoms have been associated with increased healthcare utilization, functional impairment and absenteeism from work (Kelly et al.,2001).

Antenatal depression has been implicated in nutritional deprivation and poor maternal weight gain during pregnancy. These are associated with intrauterine growth retardation(IUGR) and low neonatal birthweight (CSPLB, 1985). Intrauterine growth retardation (IUGR) is a major cause of perinatal mortality and morbidity, and an important cause of developmental impairment in later life. When depression is associated with weight loss, fetal growth may be negatively affected.

The relative risks of preterm births and post-neonatal deaths associated with depression in pregnancy have been found to be high among pregnant women who do not receive antenatal care. In USA, the relative risk (RR) of preterm birth for those who do not receive adequate prenatal care has been estimated to be 2.8-fold higher in both African-American and Caucasian-American women than in women who receive prenatal care. Infants of African-American and Caucasian-American women who did not receive appropriate prenatal care had relative risks for post-neonatal death that were 1.8 and 1.6, respectively, when compared with offspring of women who did receive such care (Vintzileos et al., 2002).

A study has found that there is an association between antenatal depression and labour complications: prolonged labour (RR 1.25,95%Cl 1.02-1.53); peripartum complications(RR 1.11,95% Cl 1.07-1.15); postpartum complications (RR 1.27,95%Cl 1.21-1.34), and non-vaginal delivery (RR 1.19,95%Cl 1.02-1.40) (Pereira et al., 2009).

It is important to note that some depressed pregnant women engage in smoking of cigarette and drinking alcohol. This dangerous habit affects the development of fetus, and can cause miscarriages, intrauterine deaths and intrauterine growth restrictions (Pajulo et al., 2001). Some may manifest suicidal tendencies (Lepine, 2001).Rates of suicidal ideation among depressed obstetric patients have ranged from 3% in Finland (Lepine, 2001) to 17.6% in the US (Birndorf et al., 2001).

Overall, this affects the millennium development goals which are decreasing child mortality(MDG 4) and improving maternal health (MDG 5). Therefore, there is need to explore the prevalence and risk factors of antenatal depression in Abeokuta North Local Government Area.

1.3 Justification

This work focused on antenatal depression in all trimesters in Abeokuta south LGA. Though there are researches done on antenatal depression worldwide, there is paucity of work done on it in Nigeria. Studies carried out on antenatal depression in Nigeria are very few. A research which was carried out in Nigeria (Abiodun et al., 2006) focused on antenatal depression among pregnant women in their third trimester. So, the prevalence of antenatal depression for the first, second and third trimesters was determined in this study.

This study will contribute to the body of knowledge of antenatal depression and identify the most prevalent predictors of antenatal depression among pregnant women in Abeokuta North LGA since this condition is neither well recognized, thoroughly studied nor properly treated clinically (Tylee et al, 2000).

1.4 Research questions

- What is the prevalence of antenatal depression (AD) among pregnant women in Abeokuta North Local Government Area?
- Does prevalence of antenatal depression increase with increasing trimester?
- What are the determinants of antenatal depression among pregnant women in the study area?
- How do depressed pregnant women seek help?

1.5 Objectives

1.5.1 Main

To determine the prevalence of antenatal depression and associated risk factors among pregnant women in Abeokuta North LGA, Ogun State

1.5.2 Specific

- To determine the prevalence of antenatal depression among pregnant women in Abeokuta North LGA.
- To determine risk factors associated with antenatal depression among pregnant women in Abeokuta North LGA.
- To determine the prevalence of the risk factors of antenatal depression among pregnant women in Abeokuta North LGA.
- To determine the health seeking behaviour for antenatal depression among women in Abeokuta North LGA.

CHAPTER TWO
LITERATURE REVIEW

2.1 Prevalence of Antenatal Depression

Antenatal depression is a silent but dreadful condition which affects pregnant women and their unborn babies. The prevalence of this condition varies from place to place, country to country and even race to race. According to the National institute of Clinical Excellence, the prevalence of antenatal depression is 10-15% in developed countries and 19-25% in economically poor countries (NICE, 2009).

A prospective cohort study done in multiethnic population in Oslo between 2008 and 2010 showed that the crude prevalence was 8.6% (95% CI: 5.45-11.75) for Western Europeans, 19.5% (12.19-26.81) for Middle Easterners, 17.5%(12.08-22.92) for South Asians and 11.3%(6.09-16.51) for other groups (Shakeel et al., 2015).Another prospective cohort study carried out in Sabah Malaysia between 2009 and 2010 showed prevalence of 13.8% (95% CI: 12.5-15.3%).A total of 2072 women were recruited for the study (Mohamad et al., 2015).

A cross-sectional study was undertaken among Chinese women (total of 292) in their third trimester and the prevalence was estimated to be 28.5% (Zeng et al., 2015). Another study that examined antenatal depression in 2nd and 3rd trimesters among pregnant African American women showed prevalence of 43.2% in second trimester and 37.8% in third trimester, where the two proportions were not significantly different (p=0.77)(Wilusz et al., 2014).

In South America, a study was carried out in Public Health clinic, Rio de Janeiro, Brazil which showed prevalence of antenatal depression to be 14.2% (Pereiral et al., 2009).Prevalence of antenatal depression was compared to that of postnatal depression in another study in which the prevalence of antenatal depression was estimated to be 28.3% and postnatal depression at 3 months was 16.4% (Verreault et al., 2014).

A systematic review of literature was conducted; thirty-five studies, with a total of 10,880 participants, were identified that reported prevalence rates of maternal psychological health in eight African countries. Antenatal depression prevalence in Africa was 11.3% (Sawyer et al., 2010). In some African countries such as Ghana, a cohort study nested within 4-weekly surveillance of all women of reproductive age to identify pregnancies in Kintampo Health

Research Center Study showed prevalence of antenatal depression to be 9.9% (95%CI: 9.5-10.3%) (Weobong et al., 2014).

In South Africa, according to a study "Pattern of Use of a Mental Health Service in a Low Resource Antenatal setting", the prevalence of antenatal depression was 18.9%(Baron et al, 2014). Another study carried in KwaZulu South Africa showed a high prevalence of 38.5% (Manikkam et al, 2012).

Furthermore, the risk of antenatal depression has been shown to be elevated in Southern Africa, especially in the context of HIV. A cross-sectional study conducted in rural South Africa showed a high prevalence of HIV-associated Antenatal depression, and it was 45% (Rochat et al.,2013). In East Africa, a cross-sectional study conducted in Malawi showed that prevalence of major depressive episode in pregnant women was 10.7% (95% CI: 6.9%-14.5%) and prevalence of major and minor depressive episodes was 21% (95% CI: 15.5-26.6%) (Stewart et al., 2013).

In Nigeria, antenatal depression has not been extensively studied but a study showed that the prevalence of antenatal depression for third trimester gestation in Nigeria is 8.3% (Abiodun et al., 2006).

This current study focused on Abeokuta North L.G.A., where the prevalence of antenatal depression for each trimester was estimated.

2.2 Risk Factors of Antenatal Depression

The aetiology of depression is unknown, but it is thought that neurobiological and environmental factors combined with genetic predisposition are influential (Ebmeier et al., 1999). During pregnancy, there are hormonal changes. The Hypothalamus-Pituitary-Adrenal Axis (HPA) is usually activated. This stimulates the secretion of cortisol in the blood from the adrenal cortex. Elevated cortisol levels inhibit estradiol synthesis and actions. So, pathogenic low levels of plasma cortisol have been associated with melancholic depression, eating disorder, chronic alcoholism and suicidal tendencies. Target at reduction of HPA activity leads to remission of depression (Holsboer, 2001).

Several researches have explored and identified risk factors associated with antenatal depression. Lancaster et al, in their research, identified some risk factors which are low income, poor social

support, unplanned pregnancy, single motherhood, large number of existing children, history of postnatal depression, young age, domestic violence and family history of psychiatric illness. Vigorous exercise (3-5 times weekly with elevated heart rate of 70-80% of maximum) was inferred to have a possible protective effect (Lancaster et al., 2010).

According to Bronwyn et al, the risk factors of antenatal depression are low esteem, antenatal anxiety, low social support, negative cognitive style, major life events, low income and history of abuse (Bronwyn et al.,2008). Another study showed that positive HIV result, low income, high-risk pregnancy and unplanned pregnancy are risk factors of antenatal depression (Burns et al., 2012).Pereira et al., in their study, showed that previous history of depression and any psychiatric treatment, unplanned pregnancy, serious physical illness and casual jobs are associated risk factors (Pereira, et al., 2009).

Furthermore, another study consolidated aforementioned findings. This study showed that unplanned pregnancy, lack of social support, low income, lack of education of women and pregnancy induced symptoms are associated risk factors (Emre et al., 2013).

Considering the obstetric risk factors of antenatal depression, multigravida, unplanned pregnancy, current obstetric complications, previous miscarriages and a past history of obstetric complication were all found to be associated with antenatal depression (Shaunak et al., 2013). Looking at sociodemographic risk factors, a study showed that low socioeconomic status, not living with a partner, tobacco use, stressful events and young age are associated risk factors (Ricordo et al., 2012).

Having reviewed some studies that explored the risk factors associated with antenatal depression, this current study not only explored risk factors present in Abeokuta LGA but also estimated the prevalence of the risk factors which defined the magnitude of Antenatal depressionin this locality.

2.3 Diagnostic and Screening Instruments for Antenatal Depression

The Diagnostic and Statistical Manual of Mental Disorders, fourth version (DSM-IV) (APA, 1994) classifies depressive disorders (unipolar depression) as Major Depressive Disorder (MDD), dysthymia and unspecified depressive disorder. However, researchers have often used

screening instruments to detect depressive symptoms as a substitute for the clinical diagnosis of MDD. For that reason, the current research examines Major Depressive Disorder and depressive symptoms as determined by standard depression-screening instruments.

The US research diagnostic standard is a Structured Clinical Interview for Axis 1 disorders (SCID-I) (First et al., 2003). This clinician-administered interview was developed for use with psychiatric patients and community subjects. It includes open-ended and probe questions regarding patient demographics, chief complaint, history of psychiatric illness and treatment, and an assessment of current functioning. Administration times vary, from one hour in subjects with no psychopathology to as long as three hours in subjects with a complicated history and several comorbid mental disorders.

The same criteria are used to diagnose depression in pregnant patients (Barrio et al., 2000). However, the DSM-IV descriptive criteria are broad, and the effect of pregnancy on the presentation and perception of signs and symptoms has not been addressed in this diagnostic classification system.

High resource utilization and costs associated with clinician diagnoses have resulted in the development of lay-administered instruments and patient self-report questionnaires to identify and quantify depression in obstetric populations (Boyd et al., 2002). Most often, researchers have used self-report questionnaires; however, consensus is lacking as to which is the instrument of choice. At least five such instruments have been used in this context. Self-report questionnaires are not diagnostic; however, they are sensitive to depressive symptoms (UDHHS et al.,1993). Cutoff scores are designed to detect respondents likely to be diagnosed with MDD (Sharp, et al., 2002).

The Edinburgh Post Natal Depression Scale (EPDS) (Cox et al., 1987), the Beck Depression Inventory (BDI) [Beck, 1961] and the Primary Care Evaluation of Mental Disorders Patient Health Questionnaire (PRIME-MD, PHQ)[Spitzer et al, 1999] have been validated for use in an obstetric population. The EPDS, a ten-item self-report scale, was designed in 1987(Cox et al, 1987) to screen for post-natal depression in community samples. It has since been validated for use in both pregnant [Murray et al., 1990] and non-pregnant women (Cox J.L., et al., 1996). Validation of the EPDS (cutoff score ≥12) against standardised psychiatric interview indicated a sensitivity of 0.50 and a specificity of 0.90 for detecting depressive symptoms during pregnancy

(Murray et al, 1990). To avoid the possibility of confounding due to the normal physiological symptoms of pregnancy, this scale assesses mood aspects of depression and does not include somatic items.

The BDI, [Beck, 1961] a self-report questionnaire consisting of 21 items, was originally designed to assess the intensity of depression in psychiatric patients. It has been validated for use in an obstetric population (cutoff score ≥16) against the National Institute of Mental Health Diagnostic Interview Schedule (DIS) version III (Salamero et al.,1994). However, scores on physical items (e.g. fatigue, sleep disturbance and loss of libido) of the BDI have been reported to be elevated for non-psychiatric pregnant women. It is suggested that low- to medium-range scores on the BDI, as indicators of depression in populations who have a high incidence of somatic complaints (e.g. pregnancy), should be interpreted with caution.

Validation of the PRIME-MD, PHQ was undertaken in a study of 3000 obstetric-gynaecological patients (Spitzer et al., 2000). The criterion standard was a psychologist's diagnosis, determined by telephone interview, in 149 subjects. Correlation for severity of depression symptoms between the PRIME-MD, PHQ and the psychologist was 0.79.

Of those instruments, the EPDS and the BDI have been used most often in observational studies. In addition, the Center for Epidemiological Studies Depression Scale (CES-D) (Radloff, 1977), although not validated, has also been used extensively in prenatal depression research. It is a 20-item questionnaire that was developed to identify and rate the severity of depression and to monitor response to therapy. When used in the general population, a cutoff score of ≥16 is indicative of depression symptoms.

This study was carried out with the aid of EPDS to screen obstetric population for antenatal depression. The choice of EPDS in this study stems from the fact that many of the research works on antenatal depression used it as a screening tool. It also has a good specificity to rule out depression.

2.4 Management of Antenatal Depression

The therapeutic goal of the treatment of antenatal depression is to achieve mental stability of mother, without causing harm to the foetus (Barrio et al., 2000). Treatment options include

pharmacotherapy and psychotherapy. It is necessary to weigh the expected benefits to both the mother and foetus against potential risks of treatment.

Epidemiological studies have been undertaken to determine the safety of drug use in pregnancy. Cohort studies of Fluoxetine, Venlafaxin, Fluroxamine, Sertraline, Paroxetine, Trazodine, Selective Serotonin Reuptake Inhibitors (SSRI) in general and Tricyclic Antidepressants (TCAs) (McElhatton et al., 1996) have reported that there appears to be no association between those drugs and major foetal malformations. Furthermore, prospective studies (Nulman et al.,2002 and Simon et al., 2002) have found no effect on global IQ, language, temperament or behavioural development of children exposed in utero to TCAs or Fluoxetine. The limitation of these latter studies is that the children have been followed up to only 4 years of age.

Not all studies, however, have reported a lack of adverse outcomes. An increase in risk of neonatal withdrawal symptoms (such as irritability, excessive crying, shivering, difficulties with eating and sleeping, and seizures) (Nordeng et al., 2001), neonatal complications (respiratory distress, hypoglycemia and jaundice) (Costei et al., 2002), delayed psychomotor development and changes in fine motor control (Casper et al., 2003) has been found in infants exposed to Antidepressants during pregnancy.

Other adverse outcomes related to the gestational use of SSRI and TCAs reported in the literature include altered neonatal acute pain response, higher rates of admissions to special care nurseries, premature deliver, miscarriages, and minor foetal anomalies (Chambers et al.,1996).

Nevertheless, there abounds a growing clinical evidence regarding the relative safety use of SSRIs and TCAs during gestational period. Based on such evidence, the Canadian Psychiatric Association, in collaboration with Canadian Network for Mood and Anxiety Treatments, issued guidelines in 2011 recommending Fluoxetine for the first-line treatment of antenatal depression (Thorpe et al, 2001).

A variety of psychotherapies including Interpersonal Psychotherapy (IPT) and Cognitive-behavioural Therapy (CBT) offer an alternative to Antidepressant medications for those patients who choose not to use pharmacotherapy. Due to the limited evidence supporting the use of psychotherapies, IPT has been recommended by the Canadian Network for Mood and Anxiety Treatment Guidelines as a third-line treatment option for obstetric patients (Spinelli et al, 2003). However, psychotherapies are associated with high resource consumption and costs and limited

pharmacotherapy and psychotherapy. It is necessary to weigh the expected benefits to both the mother and foetus against potential risks of treatment.

Epidemiological studies have been undertaken to determine the safety of drug use in pregnancy. Cohort studies of Fluoxetine, Venlafaxin, Fluroxamine, Sertraline, Paroxetine, Trazodine, Selective Serotonin Reuptake Inhibitors (SSRI) in general and Tricyclic Antidepressants (TCAs) (McElhatton et al., 1996) have reported that there appears to be no association between those drugs and major foetal malformations. Furthermore, prospective studies (Nulman et al.,2002 and Simon et al., 2002) have found no effect on global IQ, language, temperament or behavioural development of children exposed in utero to TCAs or Fluoxetine. The limitation of these latter studies is that the children have been followed up to only 4 years of age.

Not all studies, however, have reported a lack of adverse outcomes. An increase in risk of neonatal withdrawal symptoms (such as irritability, excessive crying, shivering, difficulties with eating and sleeping, and seizures) (Nordeng et al., 2001), neonatal complications (respiratory distress, hypoglycemia and jaundice) (Costei et al., 2002), delayed psychomotor development and changes in fine motor control (Casper et al., 2003) has been found in infants exposed to Antidepressants during pregnancy.

Other adverse outcomes related to the gestational use of SSRI and TCAs reported in the literature include altered neonatal acute pain response, higher rates of admissions to special care nurseries, premature deliver, miscarriages, and minor foetal anomalies (Chambers et al.,1996).

Nevertheless, there abounds a growing clinical evidence regarding the relative safety use of SSRIs and TCAs during gestational period. Based on such evidence, the Canadian Psychiatric Association, in collaboration with Canadian Network for Mood and Anxiety Treatments, issued guidelines in 2011 recommending Fluoxetine for the first-line treatment of antenatal depression (Thorpe et al, 2001).

A variety of psychotherapies including Interpersonal Psychotherapy (IPT) and Cognitive-behavioural Therapy (CBT) offer an alternative to Antidepressant medications for those patients who choose not to use pharmacotherapy. Due to the limited evidence supporting the use of psychotherapies, IPT has been recommended by the Canadian Network for Mood and Anxiety Treatment Guidelines as a third-line treatment option for obstetric patients (Spinelli et al, 2003). However, psychotherapies are associated with high resource consumption and costs and limited

availability of therapists skilled in the provision of such treatment especially CBT (Doris et al., 1999).

In this study, we explored health-seeking behaviour among women with antenatal depression. According to a study, findings were that most depressed pregnant women reported consulting their families and friends than consulting their health care professionals; most depressed women were likely to be influenced by their partners and mothers to get treated; and most preferred hospital treatments to any form of treatment (Henshaw et al., 2013).

CHAPTER THREE

METHODS

3.1 Study Area/Setting

Abeokuta North LGA is a local Government Area in Ogun State of Nigeria. It has a population of 201,329 and the population of child bearing women (15-49 years) is 51,203 at the 2006 census (NPC, 2006). Abeokuta LGA. has 15 wards, and they are Ago-Odo/IKereku/Ilawo,Ikija, Ago Oko, Elega housing/ Imala, Iberekode/ Ilugun, Ita Ota/Gbagura, Ago IKA/Ijaye Kukudi, Lafenwa/Afonta, Sabo/Ayetoro garage, Oke Ago/ Owu, Totoro/Oke Sokori, Ita OShin/Olomore, Olorunda/Ijale, Imala Orile/Idi-Emi and Ibara orile (Tripod, 2014). Akomoje in Iberekodo ward is the headquarters.

The people are predominantly farmers, most of whom engage in cultivation of arable crop, while some engage in livestock and fishing. In recent times, the people of the area are involved in quarry business, artisan works, and handicrafts such as tie and dye making and pottery (Tripod, 2014).

There are about 22 functional health facilities (both private and public) in the LGA. There are two tertiary health institutions (Federal Neuropsychiatric Hospital, Aro and Olabisi Onabanjo Teaching Hospital, Saje Annex) and six primary health centers in the LGA. There are also many private hospitals and maternity homes. The antenatal clinics in the selected health facilities in the LGA are run by doctors and nurses. Doctors and nurses run antenatal clinics in private hospitals and the teaching hospitals where comprehensive obstetric care is offered such caesarian sections, ultrasonography and blood transfusion service. In Olabisi Onabanjo University Teaching Hospital, Saje Annex, there are consultant obstetricians and gynaecologists, resident doctors and medical officers. In each primary health center, they are run by nurses and a doctor but there are few centers without a doctor. The private maternity homes are run by nurses, traditional birth attendants and community health extension workers (CHEW). Each health facility has fixed days for their ANC service. The attendance records of clients in some of the selected facilities vary markedly from one ANC day to another. E.g., in Keesi primary health centre, on an antenatal clinic day, nurses may attend 25 clients a day; and on another ANC day, the attendance drops to 10 clients or less. This applies to some other facilities. This made getting average attendance per day in these facilities challenging to estimate as this might not be representative.

3.2 Study Design

This was a cross-sectional study.

3.3 Study Population

This included all pregnant women attending Antenatal Clinics in Abeokuta North LGA.

3.4 Inclusion Criteria

- Pregnant women of all child bearing ages were included.
- Any client registering for ANC service on the day of data collection at any facility was included.

3.5 Exclusion Criteria

- Pregnant women with physical disabilities such as deafness and dumbness were excluded.
- Pregnant women with a history of or ongoing mental illness/retardation were excluded.

3.6 Sample Size Determination

Using the sample size estimation formula for cross-sectional study:

$$\text{Sample size (n)} = \frac{(Z\alpha^2 \times P(1-P) \times de)}{d^2}$$ (Cochran, 1963)

Where: n = Sample size

$Z\alpha$ = Z statistic for 95% level of confidence =1.96

P = Prevalence of antenatal depression among pregnant women in Africa (8.3% Abiodun et al., 2007)

d = Precision of 5% (0.05);

de (design effect) =2

n = 276 (After accounting for a non response rate of 15% [N = n/1-r]).

A sample size of 314 pregnant women was used to increase the power of the study.

3.7 Sampling Technique

3.7.1 Multi-Stage Cluster Sampling Technique

In Abeokuta North Local Government Area, there were about 22 health facilities that offered antenatal care (ANC) services.

1st Stage: These health facilities were stratified into three according to their levels of care. Each level was sub stratified into public and private health facilities. So, based on the level of care, the health facilities were grouped as follows:

(1) Primary health facilities: they were divided into public and private. With regards to public health facilities, there were six community health centers while for the private, there were nine private maternity clinics.

(2) Secondary health facilities: There were no secondary public health facilities (general or state hospitals) in Abeokuta North LGA. However, there were six private hospitals that offered ANC services.

(3) Tertiary health facilities: There were two tertiary health institutions in Abeokuta North LGA. They were Neuropsychiatric Hospital Aro and Olabisi Onabanjo University Teaching Hospital (OOUTH), Saje Annex. Of these two, only OOUTH Saje Annex offered ANC services.

On allocation of sample size, due to inconsistency of attendance records of selected health facilities, equal allocation method of stratified random sampling was used (Saifuddin, 2009). The sample size of 314 was shared equally among the three tiers of health care. This was determined by dividing the total sample size by three (tiers of health care), giving 104 for each tier.

2nd Stage: Selection of health facilities from stratified groups was done through simple random sampling technique.

At the primary level, using proportionate allocation ratio of 2:3 for primary health centers to maternity clinics, two primary health centers were randomly selected from the six health centers and three maternity clinics were selected randomly from the nine private maternity clinics.

At the secondary level, only private hospitals were sampled since there were no functional public (government) hospitals. Two out of the six private hospitals offering ANC services were randomly selected.

At the tertiary level, only OOUTH Saje Annex offered ANC services. So, it was selected.

3rd Stage: Cluster sampling was used at this stage.

At the primary level, the allocated sample size was 104. This was equally divided between public (primary/community health centers) and private centers (maternity clinics). So, 52 willing participants were interviewed each from primary health centers and private maternity clinics. The allocated sample size of 52 was divided between the selected primary health centers. So the sample size for each primary health center was 26. The private maternity clinics were three in number, and then the allocated sample size of 52 was divided into three. So, the sample size for each was approximately 18.

At the secondary level, there were two private hospitals. The sample size for each was 52.

At the tertiary level, 104 willing participants were surveyed. The target number per visit was 35.

4th Stage In each health facility, during the day of antenatal clinic, the total number of the pregnant women in attendance was determined. If the total number of women in attendance was equaled to the allocated sample size, all were selected for interview after obtaining their consent. If the number was more than the allocated sample size, then simple random sampling technique was used to select the required number of participants. If the number in attendance was less than the allocated sample size, all were selected, and repeat visit was made on another antenatal clinic day to complete selection.

Table 3.1 below shows frequency of distribution of respondents recruited per health facility.

Table 3.1 Distribution of respondents per health facility (N=314)

LEVELS OF CARE	Type of Facility	Names of Facilities	Number of Respondents	Percentage (%)
PRIMARY	Private	Eweje Maternity	18	5.7
		Oluseyi maternity	18	5.7
		Holy Mary Maternity	18	5.7
	Public	Keesi Health Center	26	8.3
		Iberekodo Health Center	26	8.3
SECONDARY	Private	Korede Hospital, Kugba	52	16.6
		Morab Hospital, Adedotun.	52	16.6
	Public	Nil		
TERTIARY	Private	Nil		
	Public	Olabisi Onabanjo, University Teaching Hospital, Saje Annex.	104	33.1
Total			314	100

3.8 Data Collection Instrument

A questionnaire was developed using Edinburgh postnatal depression scale, standard sociodemographic, obstetric and social history questionnaire. It was an interview-administered questionnaire. Six trained research assistants were used to interview participants throughout the period of research.

The questionnaire had three sections (Appendix 1). The first section focused on sociodemographic characteristics. The second section was on risk factors of depression and the third section centered on health seeking behaviour for antenatal depression. This questionnaire had both English and Yoruba versions. The questionnaire was developed in English and translated to Yoruba (appendix 2) and also back translated to English to ensure adequate translation. A pretest was carried out in a randomly selected health facility in Abeokuta South Local Area. To ensure comprehension of the questionnaire, about 5% of the sample size which was 16 participants were surveyed during pretest. Format of the questionnaire:

Section A

Sociodemographic characteristics (age, marital status, ethnicity, occupation, level of education, family size)

Obstetric history (parity, last menstrual period, (un)planned pregnancy, coexisting medical conditions, history of postnatal depression)

Social history (drug use, alcohol intake, cigarette smoking, supportive friends and family members)

Other risk factors (gender based violence, history of child abuse, level of income)

Section B: Edinburgh postnatal depression scale (EPDS) (see appendix 1: pages 67 and 68)

The instrument for assessing depression in the questionnaire was the Edinburgh Postnatal Depression Scale (EPDS). It is a screening instrument to detect depressive symptoms used by Epidemiologists and researchers as a substitute for clinical diagnosis of Major Depressive Disorder (MDD). The EPDS is a ten-item self-report scale which was designed in 1987 and was originally meant for postnatal depression. It has since been validated for use in both pregnant and non-pregnant women. The maximum value for EPDS is 30 while the minimum is 0 (Cox et al., 1987) and (Murray et al., 1990). EPDS score of >11 is suggestive of/ marks clinical depression.

Section C: Health seeking behavior (Hospital visit, Church visit and self medication) was assessed in this section.

3.9 Data Analysis

Data collected were entered and stored in a password-protected computer. Statistical Package for Social Science SPSS version 16.0 was used for data entry and analysis. Data cleaning was done prior to analysis. Descriptive statistics such as percentages, means and standard deviation, proportions, and range were used to summarize the data. Student t-test and Chi square were used to determine association between means of continuous variables and categorical variables, respectively. Linear multiple regression analysis was used to determine the predictors of antenatal depression from a set of factors significant at bivariate analysis ($p<0.05$). The dependent variable was antenatal depression and predictors and independent variables were the sociodemographic and obstetric variables such as marital status, age, single parenthood and unplanned pregnancy. Test of association was carried out at 5% level of significance.

The wealth scores were calculated from respondents' household possession using principal component analysis, and grouped into five groups (quintiles) to give the wealth index. The rich and the very rich had positive wealth score, the average had zero wealth score and the poor and the very poor had negative wealth score.

With regards to social support, five questions were asked about people in each respondent's life who provided her with help or support. Then, using Sarason et al (1983) method of calculating social support questionnaire number score (SSQN), the SSQ number scores for all participants were ~~determined~~ and grouped into three groups. SSQN score<1 stood for low social support, SSQN score=1 stood for average social support and SSQN score>1 stood for high social support.

3.10 Ethical Considerations

This study was approved by the Ogun State Ministry of Health Ethical Board (Appendix 3). Participants had right to accept or decline request to participate. Written informed consent was obtained from the participants and their confidentiality was preserved (see Appendix 1: page 64). They were not forced or intimidated to participate. They were assured of getting the benefits of valuable information about their health, appropriate health advice on how to manage their conditions and final feedback at the end of the project. There were no financial inducements and data was collected and presented without any falsification.

CHAPTER FOUR

RESULTS

The results of this study are presented in three sections. The first section presents the results of socio-demographic characteristics, obstetric history and social history, the second section shows results of screening of participants with Edinburgh Postnatal Scale for depression, associations between potential risk factors and antenatal depression, and predictors of antenatal depression. Finally, the last section presents the results of health-seeking behavior of study participants towards real or perceived symptoms of antenatal depression.

4.1 Section A

4.1.1 Socio-demographic Characteristics of Respondents

Three hundred and fourteen (314) pregnant women were recruited from eight health facilities. Table 4.1.1.2 shows socio-demographic characteristics of study participants. The mean age of the pregnant women was 27.3±5.3 years. Majority of the participants were Yoruba with total number being 308(98.1%). According to marital status, single and married pregnant women were 18(5.7%) and 292(93.0%) respectively. Pregnant women with no formal education were seven (2.2%). Those who had primary education only were 75 (24.0%); secondary education were only 158(50.6%) and those who attained tertiary level of education were 72 (23.1%). Two hundred and ninety three participants responded when asked about their type of family, and 230(78.5%) were from monogamous family while 61(20.8) were from polygamous family. The respondents' family sizes were divided into three groups based on the average household size which is 5 in Nigeria (NDHS, 2003): small family size (1-4 persons) 204(68.9%), average family size (5 persons) 41(13.9%) and large family size (≥6 persons) 51(17.2%). According to occupational status, the least were the civil servants who totaled six (1.9%) while traders had the highest number 174 (55.9%). Table 4.2 shows household amenities/possessions of the study participants. Table 4.3 shows the wealth index of the study participants. With regards to wealth index, the very rich had the lowest number 10 (3.2%) while the poor had the highest number 131 (41.7%).

Table 4.1Distribution of respondents by Sociodemographic characteristics

CHARACTERISTICS		Frequency (n)	Percentage (%)
Age Group (N=311)	15-20 yrs (young)	34	10.9
	21-35 yrs	255	82.0
	36-49 yrs(Elderly)	22	7.1
Ethnicity (N=314)	Yoruba	308	98.1
	Others	6	1.9
Marital Status (N=314)	Single	18	5.7
	Married	292	93.0
	Others(separated or divorced)	4	1.3
Level of Education (N=311)	No Formal Education	7	2.2
	Primary	75	24.0
	Secondary	158	50.6
	Tertiary	72	23.1
Type of Family (N=293)	Monogamous	230	78.5
	Polygamous	61	20.8
	Others	2	0.7
Family Size (N=296)	Small (1-4persons)	204	68.9
	Average (5persons)	41	13.9
	Large (6 persons and above)	51	17.2
Occupation (N=311)	Civil servants	6	1.9
	Unemployed	10	3.2
	Students	13	4.2
	professional	34	10.9
	Artisans	74	23.8
	Traders	174	55.9

Table 4.2 Distribution of household amenities/possessions of the respondents(N=314)

HOUSEHOLD AMENITIES/POSSESSIONS		Frequency(n)	Percentage(%)
Living in Concrete House	Yes	313	99.7
	No	1	0.3
Living in Mud House	Yes	1	0.3
	No	313	99.7
Possess Television	Yes	220	70.1
	No	94	29.9
Possess Refrigerator	Yes	125	39.8
	No	189	60.2
Possess Car	Yes	44	14.0
	No	270	86.0
Possess Table and Chair	Yes	274	87.3
	No	40	12.7
Possess bed	Yes	313	99.7
	No	1	0.3
Availability of Electricity	Yes	311	99.0
	No	3	1.0
Have Livestock (Goats/Sheep/Cow/Chickens)	Yes	14	4.5
	No	300	95.5
Cook with Stove	Yes	301	95.5
	No	13	4.1
Cook with Gas Cooker	Yes	48	15.3
	No	266	84.7
Cook with Firewood	Yes	11	3.5
	No	303	96.5

Table 4.3Distribution of respondents by wealth index (N=314)

Wealth Index		Frequency(n)	Percentage (%)
Wealth Index (N=314)	Very poor	48	15.3
	Poor	131	41.7
	Average	70	22.3
	Rich	55	17.5
	Very rich	10	3.2

4.1.2. Obstetric History of Respondents

Table 4.4 shows results on history of index pregnancy. The age of pregnancy of each study participant was calculated from her last menstrual period (L.M.P.) and expected date of delivery (E.D.D.), and this was confirmed with her obstetric ultrasound scan result. The mean geastatonal age of pregnancy at time of interview was 6.31±2.15 months. Pregnant participants in their first(1-3 months), second (4-6 months) and third trimesters (7-9 months) were 51(16.3%), 92(29.4%) and 170(54.3%), respectively. When asked if the index pregnancy was a planned one, 236(75.4%) affirmed it was expected and planned for while 77(24.6%) did not expect it. With regards to co-existing medical conditions, 293(96.1%) out of 305 did not have any medical condition in pregnancy while those with varied medical conditions were 12(3.9%). Table 4.5 shows results on gynaecological/past obstetric history of the respondents. According to the number of times each participant had become pregnant (gravidity), 71(23.0%) and 238(77.0%) were primigravida and multigravida, respectively. Considering the parity (the number of childbirths above 28 weeks irrespective of outcomes), nulliparous, primparous and multiparous participants were 91(29.6%), 93(30.3%) and 123 (40.1%), respectively. Eighty five (28.1%) out of 303 respondents had procured abortions or had miscarriages in the past. Table 4.6 shows results on history of previous childbirths. A total of 194 out of the 314 participants had a combined number of childbirths of 359; 172(47.9%) were male babies while 187(52.1%) were females. According to mode of deliveries, 349(97.2%) babies were delivered via vaginal route while 10 (2.8%) were born through caesarian section. Considering the weight of babies at birth, babies with normal birth weight were 351(97.8%) while those with low birth weight and high birth weight were 6(1.7%) and 2(0.6%), respectively. All babies were said to have been breastfed.

Table 4.4Distribution of respondents by History of index pregnancy

VARIABLES		Frequency (n)	Percentage (%)
Age of Pregnancy In Months (N=313)	First Trimester (1-3 months)	51	16.3
	Second Trimester (4-6 months)	92	29.4
	Third Trimester (7-9 months)	170	54.3
Was The Pregnancy Expected (Planned) (N=313)	Yes	236	75.4
	No	77	24.6
Co-Existing Medical Conditions (N=305)	Hypertension	2	0.7
	Diabetes	1	0.3
	HIV	5	1.6
	Others	4	1.3
	No Co-existing Condition	293	96.1

Table 4.4Distribution of respondents by History of index pregnancy

VARIABLES		Frequency (n)	Percentage (%)
Age of Pregnancy In Months (N=313)	First Trimester (1-3 months)	51	16.3
	Second Trimester (4-6 months)	92	29.4
	Third Trimester (7-9 months)	170	54.3
Was The Pregnancy Expected (Planned) (N=313)	Yes	236	75.4
	No	77	24.6
Co-Existing Medical Conditions (N=305)	Hypertension	2	0.7
	Diabetes	1	0.3
	HIV	5	1.6
	Others	4	1.3
	No Co-existing Condition	293	96.1

Table 4.5Distribution of respondents by gynaecological/past obstetric history

VARIABLES		Frequency (n)	Percentage (%)
Gravidity (N=309)	Primigravida	71	23.0
	Multigravida	238	77.0
Parity (N=307)	Nullipara	91	29.6
	Primipara	93	30.3
	Multipara	123	40.1
Abortions/Miscarriages (N=303)	None	218	71.9
	One or More	85	28.1

Table 4.6 History of previous childbirths among respondents

PREVIOUS PREGNANCIES (N=359)		Frequency (n)	Percentage(%)
Sex of Baby	Male	172	47.9
	Female	187	52.1
Mode of Deliveries	Caesarian Section	10	2.8
	Vaginal Delivery	349	97.2
Weights	Low Birth Weight(<2.5kg)	6	1.7
	Normal Weight (2.5-4.0kg)	351	97.8
	High Birth Weight(>4.0kg)	2	0.6
Breastfed?	Yes	359	100.0
	No	0	0.0

4.1.3. Social History of Respondents

Table 4.7 shows social experience, behavior and lifestyle of the study participants. When asked about smoking of cigarette in the index pregnancy, one (0.3%) out of 298 respondents smoked. When asked about alcohol drinking in the index pregnancy, 17 (5.8%) out of 294 respondents affirmed they drank alcohol. According to the type of alcohol taken by these 17 respondents, five (29.4%) took beer, six (35.3) took wine and six (35.3%) took spirit/liquor. Two (11.8%) took alcohol for medicinal reasons while 15 (88.2%) took it for pleasure. According to social support, those with low social support (SSQN<1), average social support (SSQN=1) and high social support (SSQN>1) were 29 (9.2%), 216 (68.8%) and 69 (22.0%), respectively. When asked about some forms of abuse they had received from their husbands/lovers or any male gender, six (1.9%) had been raped, 18 (5.7%) had been physically assaulted, 15 (5.1%) had been threatened/intimidated and 16 (5.1%) had been deprived of financial support. Considering their childhood experience while growing up, 239 (76.1%) had pleasant experience, 17 (5.4%) had unpleasant experience and the rest 58 (18.5%) indicated they do not know.

Table 4.7Distribution of study participants by Social history

VARIABLES		Frequency(n)	Percentage (%)
Smoking Cigarette in this Pregnancy? (N=298)	Yes	1	0.3
	No	297	99.7
Drinking Beer, Wine and/or Spirit/Liquor In This Pregnancy? (N=294)	Yes	17	5.8
	No	277	94.2
Kind of Alcohol Respondents Take (N=17)	Beer	5	29.4
	Wine	6	35.3
	Spirit/Liquor	6	35.3
Reasons for Drinking Alcohol In This Pregnancy (N=17)	For pleasure	15	88.2
	Medicinal	2	11.8
Social Support (Ssqn) (N=314)	Low Social Support (SSQN<1)	29	9.2
	Average Social Support (SSQN=1)	216	68.8
	High Social Support (SSQN>1)	69	22.0
Gender Based Abuse (N= 314)	Rape	6	1.9
	Intimidation/Threat	16	5.1
	Inadequate Financial Support/ Financial Deprivation	16	5.1
	Physical assault	18	5.7
	None	258	82.2
Childhood Experience (N=314)	Pleasant	239	76.1
	Unpleasant	17	5.4
	I don't know	58	18.5

4.2 Section B

4.2.1. Edinburgh Postnatal Depression Scale Screening Test Results

Table 4.8 shows the results of screening carried out among participants using Edinburgh Postnatal Depression Scale (EPDS). Seventy seven (24.5%) scored 12 and above which was suggestive of depression while the rest 237 (75.5%) scored below 12. The overall prevalence of antenatal depression was 24.5%.

Table 4.8 Edinburgh Postnatal Depression Scale Screening Results

EDINBURGH POSTNATAL DEPRESSION SCALE (EPDS) (N=314)	Frequency (n)	Percentage (%)
Depressed (EPDS ≥ 12)	77	24.5
Non Depressed (EPDS < 12)	237	75.5
Total	314	100.0

4.2.2. Associations between Potential Risk Factors (Variables) and Antenatal Depression Based on EPDS Scores

4.2.2.1. Associations between Sociodemographic Variable and Antenatal Depression

In this subsection, Table 4.9 shows associations between sociodemographic variables and antenatal depression (based on EPDS scores). There was a significant association between levels of care and antenatal depression. Prevalence of antenatal depression was highest among those women attending antenatal clinic in a health facility offering tertiary level of care, and then followed by those receiving antenatal care at health facilities offering primary level of care. When level of care was further analyzed in relation with depression by stratifying heath facilities into private and public subgroups as shown in table 4.10, it became obvious that prevalence of antenatal depression was lower in all private health facilities. According to table 4.9 there were significant associations between type of facility and antenatal depression (p=0.000), maternal age and antenatal depression (p=0.012), marital status and antenatal depression (p=0.010), level of education and antenatal depression (p=0.022), and family size and antenatal depression (p=0.029). On the type of health facility, the prevalence of antenatal depression was higher in public health facilities. Considering the age of respondents, prevalence of antenatal depression was highest among women within 15-20years, and then followed by those within 21-35 years. Considering marital status, prevalence of antenatal depression was high among single pregnant women; this makes single marital status a risk factor. According to level of education, there was high prevalence of antenatal depression among women without formal education compared to other levels of education. According to family size, there was high prevalence of antenatal depression among women with large family size, then followed by women with small family size; therefore.

Still considering table 4.9 there were no significant associations between occupation and antenatal depression (p=0.429), type of family and antenatal depression (p=0.891), and wealth index and antenatal depression (p=0.822).

Table 4.9 Associations between sociodemographic variables and antenatal depression

CHARACTERISTICS	Depressed n (%)	Non Depressed n (%)	Total (%)	χ^2	P value
Level of Care (N=314)					
Primary	28(26.4)	78(73.6)	106(100)		
Secondary	13(12.5)	91(87.5)	104(100)	14.051	0.001
Tertiary	36(34.6)	68(65.4)	104(100)		
Type Of Health Facility (N=314)					
Public Health Facilities	55(35.3)	101(64.7)	156(100)	19.300	0.000
Private Health Facilities	22(13.9)	136(86.1)	158(100)		
Age group (N=311)					
15-20years (Young)	15(44.1)	19(55.9)	34(100)		
21-35years	58(22.7)	197(77.3)	255(100)	8.917	0.012
36-49years (Elderly)	3(13.6)	19(86.4)	22(100)		
Marital Status(N=314)					
Single	9(50)	9(50)	18(100)	6.697	0.010
Married/Others(divorced/separated)	68(23)	228(77)	296(100)		
Level of Education (N=311)					
No Formal Education	5(71.4)	2(28.6)	7(100)		
Primary	17(22.7)	58(77.3)	75(100)	9.592	0.022
Secondary	41(25.9)	117(74.1)	158(100)		
Tertiary	14(19.4)	58(80.6)	72(100)		
Occupation (N=311)					
Professionals	6(17.6)	28(82.4)	34(100)		
Civil Servants	1(16.7)	5(83.3)	6(100)		
Artisans	17(23)	57(77)	74(100)	3.837	0.429
Traders	44(25.3)	130(74.7)	174(100)		
Students /Unemployed	9(39.1)	14(60.9)	23(100)		
Type of Family (N=293)					
Monogamy	53(23)	177(77)	230(100)	0.019	0.891
Polygamy/Others	14(22.2)	49(77.8)	63(100)		
Family Size (N=296)					
Small Family Size(1-4 persons)	49(24)	155(76)	204(100)		
Average Family Size(5 persons)	4(9.8)	37(90.2)	41(100)	7.047	0.029
Large Family Size(≥6 persons)	17(33.3)	34(66.7)	51(100)		
Wealth Index (N=314)					
Very Poor	14(29.2)	34(70.8)	48(100)		
Poor	34(26)	97(74)	131(100)		
Average	16(22.9)	54(77.1)	70(100)	1.528	0.822
Rich	11(20)	44(80)	55(100)		
Very Rich	2(20)	8(80)	10(100)		

Table 4.10 Association between level of care (stratified into private and public health facilities) and antenatal depression

			depressed	not depressed	Total	χ^2	P value
Level of Care	Private Maternity Clinics (primary)	Count	9	45	54	19.702	0.000
		Percentage (%)	16.7%	83.3%	100.0%		
	Primary/Community Health Centers(pubic) (primary)	Count	19	33	52		
		Percentage (%)	36.5%	63.5%	100.0%		
	Private Hospitals (secondary)	Count	13	91	104		
		Percentage (%)	12.5%	87.5%	100.0%		
	State Teaching Hospital(public) (tertiary)	Count	36	68	104		
		Percentage (%)	34.6%	65.4%	100.0%		
Total		Count	77	237	314		
		Percentage (%)	24.5%	75.5%	100.0%		

4.2.2.2. Associations between Obstetric/Gynaecological Variables and Antenatal Depression

Table 4.11 shows associations between obstetric variables and antenatal depression. There were significant associations between planned pregnancy and antenatal depression (p=0.014), co-existing medical conditions and antenatal depression (p=0.034), and history of previous caesarian section and antenatal depression (p=0.032). According to expected (planned) pregnancy, prevalence of antenatal depression was higher among women with unplanned pregnancy than it was among those with planned pregnancy. Among respondents with co-existing conditions, prevalence of antenatal depression was higher than it was among those with no co-existing medical condition; this makes the presence of co-existing medical condition a risk factor. The prevalence of antenatal depression among respondents with history of previous caesarian section was high, therefore, history of previous caesarian section a risk factor.

There was no association between age of pregnancy and antenatal depression (p=0.845), but prevalence of antenatal depression decreased slightly with increasing trimester. Prevalence of antenatal depression in first, second and third trimesters were 27.5%, 25% and 23.5%, respectively.

There were no associations between gravidity and antenatal depression (p=0.809), parity and antenatal depression (p=0.344), and abortions/miscarriages and antenatal depression (p=0.546).

Table 4.11 Associations between obstetric/gynaecological variables and antenatal depression

CHARACTERISTICS	Depressed n(%)	Non Depressed n(%)	Total (%)	χ^2	P value
Age Of Pregnancy In Months (N=313)					
First Trimester (1-3 months)	14(27.5)	37(72.5)	51(100)		
Second Trimester (4-6 months)	23(25)	69(75)	92(100)	0.336	0.845
Third Trimester (7-9 months)	40(23.5)	170(76.5)	170(100)		
Was The Pregnancy Expected (Planned)(N=313)					
Yes	50(21.2)	186(78.8)	236(100)	6.029	0.014
No	27(35.1)	50(64.9)	77(100)		
Co-Existing Medical Conditions (N=305)					
Present	6(50)	6(50)	12(100)	4.503	0.034
Absent	68(23.2)	225(76.8)	293(100)		
Gravidity (N=309)					
Primigravida	18(25.5)	53(74.5)	71(100)	0.059	0.809
Multigravida	57(23.9)	181(76.1)	238(100)		
Parity (N=307)					
Nullipara	18(19.8)	73(80.2)	91(100)		
Primipara	27(29)	66(71)	93(100)	2.136	0.344
Multipara	31(24.2)	92(75.8)	123(100)		
Abortions/Miscarriages (N=303)					
None	56(25.7)	162(74.3)	218(100)	0.365	0.546
One or More	19(22.4)	66(77.6)	85(100)		
History of Previous Caesarian Sections (N=194)					
Yes	5(55.6)	4(44.4)	9(100)	4.589	0.032
No	44(23.8)	141(76.2)	185(100)		

4.2.2.3. Associations between Social History and Antenatal Depression

Table 4.12 shows significant associations between drinking alcohol during pregnancy and antenatal depression (p=0.004) and gender based abuse and antenatal depression (p=0.001). On alcohol intake, prevalence of antenatal depression was higher among respondents who drank alcohol during pregnancy than it was among those who did not drink. On gender based abuse (GBA), prevalence of antenatal depression was higher among respondents who had experienced one or more types of GBA.

There was no significant association between social supports and antenatal depression (p=0.329), but prevalence of antenatal depression was highest among those with low social support. There was no association between childhood experience and antenatal depression (p=0.122), though prevalence was higher among those with unpleasant childhood experience.

Table 4.12 Associations between social history and antenatal depression

CHARACTERISTICS	Depressed n(%)	Non Depressed n(%)	Total (%)	χ^2	P value
Drinking Beer, Wine and/or Spirit/Liquor In This Pregnancy? (N=294)					
Yes	9(52.9)	8(47.1)	17(100)	8.441	0.004
No	61(22)	216(780	277(100)		
Social Support (SSQ) (N=314)					
Low Social Support	10(34.5)	19(65.5)	29(100)		
Average Social Support	53(24.5)	163(75.5)	216(100)	2.222	0.329
High Social Support	14(20.3)	55(79.7)	69(100)		
Gender Based Abuse (N= 314)					
Rape	3(50)	3(50)	6(100)		
Physical Assault	9(50)	9(50)	18(100)		
Intimidation/Threat	8(50)	8(50)	16(100)	18.636	0.001
Financial deprivation/Poor Financial support	6(37.5)	10(62.5)	16(100)		
None	51(19.8)	207(80.2)	258(100)		
Childhood Experience (N=256)					
Pleasant	58(24.3)	181(75.7)	239(100)	2.395	0.122
Unpleasant	7(41.2)	10(58.8)	17(100)		

4.2.3. Predictors of Antenatal Depression

A multiple regression predicting antenatal depression was conducted and results are provided in table 4.13 Antenatal depression was significantly predicted from a set of factors significant at bivariate analysis ($F=3.081$, $p<0.001$). Three risk factors emerged from the model as significant predictors. They were gender based violence (AOR=4.305, 95% CI: 2.088-8.877), type of facilities (AOR=4.995, 95% CI: 2.524-9.885) and drinking alcohol in pregnancy (AOR=5.051, 95% CI: 1.708-14.937). Type of facility and gender based violence were very strong predictors of antenatal depression.

Variables	Unadjusted OR	95%CI	Adjusted OR	95%CI
Age				
15-20years (ref)	1.00			
21-35years	2.68	1.28-5.61		
36-49years	5.00	1.24-20.14		
Level of Education				
No Formal Education (ref)	1.00			
Primary	8.53	1.52-47.95		
Secondary	7.13	1.33-38.20		
Tertiary	10.36	1.82-59.04		
Marital status				
Single (ref0	1.00			
Married/Others**	3.42	1.31-8.98		
Family size				
Small Family Size(1-4 persons)	1.58	0.81-3.08		
Average Family Size(5 persons)	4.63	1.42-15.12		
Large Family Size(≥6 persons) (ref)	1.00			
Type of Facility*				
Public Health Facilities (ref)	1.00			
Private Health Facilities	3.37	1.93-5.88	5.00	2.52-9.89
Intake of alcohol*				
Yes (ref)	1.00			
No	3.98	1.48-10.76	5.05	1.71-14.94
Gender based abuse*				
Present (ref)	1.00			
Absent	3.90	2.10-7.24	4.31	2.09-8.88
Was pregnancy expected?				
Yes	2.01	1.14-3.53		
No (ref)	1.00			
Co-existing medical conditions				
Present (ref)	1.00			
Absent	3.31	1.03-10.59		
History of previous Caesarian Sections				
Yes (ref)	1.00			
No	4.01	1.03-15.57		

* Predictors ** divorced and seperated

4.3 Section C

4.3.1 Health Seeking Behaviour for Antenatal Depression among depressed Respondents

Table 4.14 shows health seeking behaviour for antenatal depression among depressed respondents. With regards to the frequency distribution of who depressed respondents consulted when they were sad or lost interest in their routine activities, majority of the participant chose husband/lover (68.9%), and then followed by those who chose doctor (12.2%). With regards to the frequency distribution of the form of treatment they sought when they were sad or lost interest in routine activities for over one week, thirty nine (52%) chose going for prayers in the church, and then 31 (41.3%) chose hospital treatment. Considering the frequency distribution of who informed their decisions to get treated, forty three (57.3%) chose doctor, and then followed by 24 (32%) participants who chose husband/lover.

Table 4.14 Health seeking behaviour for antenatal depression among depressed respondents

	Options	Frequency(n)	Percentage (%)
Frequency distribution ofwho respondents consulted when they were sad or lost interest in their routine activities (N=74)	Husband/Lover	51	68.9
	Doctor	9	12.2
	Family	8	10.8
	Friends	4	5.4
	Others	2	2.7
Frequency distribution of the forms of treatment respondents sought when they were sad or lost interest in routine activities for over one week (N=75)	Prayer in the Church	39	52
	Hospital Treatments	31	41.3
	Self medication	3	4
	No treatment	2	2.7
Frequency distribution of who informed respondents' decisions to get treated (N=75)	Doctor	43	57.3
	Husband/Lover	24	32
	Family	5	6.7
	Friends	1	1.3
	Others	2	2.7

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

This study explored prevalence of antenatal depression and its associated risk factors among pregnant women attending antenatal clinic in Abeokuta North Local Government Area (L.G.A.). In this study, prevalence of risk factors among the study participants were identified. The predictors of antenatal depression were also identified. In addition, the health-seeking behavior of the study participants was determined.

5.1.1 Discussion

The Edinburgh Postnatal Depression Scale (EPDS) was used to screen the study participants, and the determined prevalence of antenatal depression was 24.5%. This supports the finding of National Institute of Clinical Excellence which found prevalence of antenatal depression in developing countries to range from 19 to 25% (NICE, 2009). Another finding observed in a study showed a prevalence rate of 21% in Malawi (Stewart et al, 2013); and another study showed prevalence of 25% in Ethiopia (Abera et al., 2015). The reason for this high prevalence might be that most pregnant women with antenatal depression are not fully aware they are depressed, and when some complain to their doctors about symptoms of antenatal depression, the doctors could mistake them for symptoms of other medical conditions as there is no screening for antenatal depression. This was observed in a study that antenatal depression is neither recognized nor adequately treated (Tylee, 2000). The high prevalence of some risk factors of antenatal depression in this study may also account for the high prevalence. Risk factors such as gender based violence, poor public healthcare service and intake of alcohol in pregnancy were predictors of antenatal depression in this study. A cross-sectional study conducted in a rural South African area showed a high prevalence of antenatal depression, and it was 45% (Rochat et al..2013). The reason for this high prevalence was because of high prevalence of HIV among pregnant women in that area.

The increasing prevalence of antenatal depression is of public concern; hence, health education and awareness campaigns should be embarked on to enlighten the populace about how to identify antenatal depression symptoms and the dangers of not getting it treated early. Edinburgh Postnatal Depression Scale (EPDS) screening should be introduced as part of antenatal care

assessment in both private and public health facilities to help identify women with antenatal depression or at risk of developing it, and an invite sent to Psychiatric team for co-management. Measures such as education and awareness campaigns targeting at reducing or prevention of risk factors should be embarked on. Successful reduction or elimination of risk factors will definitely reduce prevalence of antenatal depression.

The prevalence of antenatal depression in first, second and third trimesters was 27.5%, 25% and 23.5% respectively. The prevalence of antenatal depression peaked in the first trimester and then gradually decreased across the second and third trimesters, albeit all trimesters have similar rates. Similar finding was observed by Gavin who reported that prevalence of antenatal depression appears to peak in the first trimester (Gavin et al., 2005).

The first trimester prevalence of antenatal depression in this study correlated to the finding of a study with 357 pregnant women in Hong Kong in which antenatal depression prevalence was 22.1%(Lee et al., 2007). This underscores the need to create awareness and educate pregnant women on the importance of registering early, especially in the first trimester as this will provide them the opportunity to be screened for depression and those affected picked early for prompt treatment.

The second trimester prevalence of antenatal depression in this study is equally high (25%). This is similar to a finding in Ethiopia with second trimester prevalence of 27.6% (Abera et al., 2015), but a higher prevalence of 43.2% among African American women has been reported (Wilusz et al., 2014)

Furthermore, the prevalence of AD in the third trimester, though lower than it was in the first and second trimesters, was still high at 23.5%. This is supported by a similar finding observed in a cross sectional study carried out with 292 Chinese women in whom prevalence of AD in the third trimester was 28.5% (Zeng et al., 2015). A lower prevalence of AD in third trimester (8.3%) in Nigeria was observed (Abiodun et al., 2006); and a higher prevalence of 37.8% among African American women has been reported (Wilusz et al., 2014). If depression is not treated at this stage, it might spill over to postpartum, resulting to postnatal depression.

Due to high prevalence of AD across the three trimesters, screening of pregnant women in each trimester should be established. This implies that each pregnant woman should be screened at

least thrice for depression before childbirth, with one screening in each trimester. Education of risks associated with untreated antenatal depression should be initiated at various health facilities.

In this study, about ten risk factors were determined, out of which, three were identified as predictors of antenatal depression among women attending antenatal clinics in Abeokuta North L.G.A. The risk factors identified were attending antenatal care in public facilities, gender based abuse, drinking of alcohol in pregnancy, young age, presence of co-existing medical condition, history of previous caesarian section, unplanned pregnancy, single marital status, lack of education and large family size. The level of care was significantly associated with antenatal depression in Table 4.9 but when it was further analyzed by stratifying the health facilities into private and public health facilities (see Table 4.10), it became obvious that there was lower prevalence of AD in private maternity clinics which was similar to the finding observed in private hospitals. This implies that the observed high prevalence of antenatal depression in primary level of care was due to higher prevalence of antenatal depression observed in primary health centers. Hence, the level of care may not be seen as a risk factor.

In this study, attending a public health facility for antenatal care is a risk factor and predictor of antenatal depression due to higher prevalence of antenatal depression among pregnant women observed in the facilities. Though participants were not asked if the quality of service given in the public facilities affected them positively or negatively, some researchers in their studies identified possible reasons. According to Mannava et al. who explored attitude and behaviour of health care workers towards their pregnant clients in Africa, and Asia using secondary data from five electronic databases from January 1990 to December 2014, some inferences were ~~determined~~ suggesting poor healthcare service rendered in public health facilities. These poor services were long hours of waiting for doctors or nurses due to high workload, absenteeism or unavailability of providers, verbal abuse, rudeness such as ignoring or ridiculing clients, neglect, authoritarian, frightening and unfriendly attitude of staff towards their pregnant clients (Mannava et al., 2015). Some similar findings were observed in focal group discussion (FGD) involving women of child bearing age and men from two communities in Calabar and health staff of University of Calabar Teaching Hospital which found that negative staff attitudes towards patients stood as a barrier to the utilization of available obstetric care; and it was found that lack

of incentives, inadequate materials and equipment to work with and poor remuneration contributed to negative staff attitudes (Asuquo et al., 2000). These poor conditions can cause despair and stress to pregnant women, and then resulting to depression. According to Karen Bruno, sustained stress leads to elevated hormones such as cortisol, 'the stress hormone', and reduced serotonin and other neurotransmitters in the brain. When the stress response fails to shut off and reset after a difficult situation has passed, it can lead to depression (Karen, 2009). The difference in healthcare service between public and private health facilities in Nigeria was also observed in a study which reported that persistently low quality and inadequacy of health service provided in public facilities in Nigeria has made the private sector an unavoidable choice (Ibukun et al., 2012). There should be disciplinary system in place to checkmate unfriendly and hostile staff. Provision of incentives to hospital staff, enhanced regular pay and regular training of staff are suggested as possible solutions to hospital induced depression (Asuquo et al., 2000).

Young age (15-20 years) was identified as a risk factor of AD in this study and the prevalence of pregnancy in young age was 10.9%. This finding is similar to WHO report of 11% prevalence of pregnancy in young age (WHO, 2015) while prevalence of antenatal depression within this age group was 44.1%. Young age as a risk factor was also identified in some studies (Ricordo et al., 2012 and Lancaster et al., 2010). The reasons for this high prevalence of AD in young pregnant women might be that most are still single and financially dependent on their parents; some lack support from their male partners (Lesser et al., 1998). Some may be stigmatized by their parents, friends and colleagues. All these could lead to depression, and make some to procure illegal abortions which might lead to infertility, perforated uterus, profuse bleeding per vagina, and death. Some might even think of committing suicide. Community education and awareness is very necessary to sensitize the populace the need for their young pregnant daughters to register early for antenatal care. Effective social support should be established for this vulnerable group and family planning should be part of education to avoid occurrence or future recurrence.

Premarital pregnancy was also identified as a risk factor of antenatal depression in this study. Prevalence of premarital pregnancy or pregnant single women in this study was 5.7%, but data are small to support this finding. Prevalence of AD among pregnant single ladies was 50%. A study observed a similar finding (Lancaster et al., 2010). Reasons for this very high prevalence could be lack of support from family members and male partners, poor financial capacity and

having unwanted pregnancy. Education of increased risks of untreated depression should be intensified. Adequate social support system should be introduced.

Another risk factor identified in this study was unplanned pregnancy. The prevalence of unplanned pregnancy in this study was 24.6%. A similar finding reported 26.6% in a cross sectional study with 5,233 University students in Nigeria (Ekanem et al., 2004) and another study reported 28% in Ogoja and Obudu, Cross River state, Nigeria (Gilda et al, 2006). In this study, prevalence of AD among unplanned pregnant women was 35.1%. Unplanned pregnancy have been reported in several studies as a risk factor of antenatal depression (Lancaster et al., 2010; Bronwyn et al., 2008; Pereira, et al., 2009; Emre et al., 2013; and Shaunak et al., 2013). Reasons for the high prevalence of AD might be that most are not financially, psychologically or socially prepared to cope with the demands of pregnancy; some are single and very young (Gilda et al, 2006); the married ones might be abused by their spouses; some were raped or forced to have sex; and some had contraceptive failure (Kilma CS, 1998). Education of risks of antenatal depression, and family planning should be initiated.

Furthermore, lack of education was identified as a risk factor of AD in this study. The proportion of participants with no formal education in this study was 2.2%. According to Central Intelligence Agency (CIA), illiteracy rate among Nigerian women is 49.6% (CIA World Factbook, 2015). This is far higher than what was obtained in this study. The reason for this might be that most pregnant women attending antenatal clinics are literate. Secondly, the study group was pregnant women only; and thirdly literacy rate in Ogun state is higher than the national average (NBS, 2010). Lack of education of woman as a risk factor was also identified in another study (Emre et al., 2013). Illiteracy has been strongly linked to low self esteem, feeling of worthlessness and shame (Weiss et al., 2007). Government should introduce literacy education to these illiterate or poorly educated pregnant women to improve self-efficacy which has been demonstrated to lessen depression symptoms (Weiss et al., 2007).

In this study, the presence of a medical condition in pregnancy was a risk factor. Some of these conditions were chronic illnesses such as HIV, hypertension and diabetes mellitus. This is similar to findings observed in some studies in KwaZulu Natal, South Africa and Rio de Janeiro, Brazil (Manikkam et al., 2012 and Pereira, et al., 2009). The prevalence of HIV in pregnancy in

this study was 1.6%. This is lower than 3.6% prevalence of HIV in pregnancy which was reported in a study done in Nnewi, Nigeria (Osita et al., 2013). The lower rate could be that some might not want to disclose their status due to fear of stigmatization. The prevalences of hypertension and diabetes mellitus in pregnancy in the study were 0.7% and 0.3% respectively. The prevalence of hypertension in pregnancy in this study is far below prevalence of 17% reported in a study in Sokoto state (Swati et al., 2014). The reason for this observation was that no blood pressure measurement was carried out during survey; rather it was what the participants reported during survey interview that was documented. The prevalence of gestational diabetes in this study is similar to the finding observed in a study which reported prevalence of 0.298% in Rivers State, Nigeria (Wokoma et al., 2001). Depression is one of the complications of chronic illnesses. These illnesses cause tremendous life changes and limit mobility and independence. This can make pregnant women not to do things they enjoy which can eat away self confidence and sense of hope in the future. No surprise they often feel despair and sad (Goldberg, 2014). In this situation, early diagnosis and treatment of depression and co-existing medical conditions is very important. Social support should be encouraged by reaching out to family and friends.

Another important risk factor and predictor of antenatal depression in the study was gender based abuse. This is supported by a similar finding in a study in California, Los Angeles (Michael et al., 2010). Prevalence rates of rape, physical assault, threats/intimidations and poor financial support/financial deprivations (economic violence) experienced by the study participants were 1.9%, 5.7%, 5.1% and 5.1% respectively. The prevalence of rape in this study is supported by a similar finding observed in Abeokuta which reported 2.7% (Fawole et al., 2008). According to Fawole et al., prevalence rates of physical assault and threats of women were 10.8% and 6.8% respectively (Fawole et al., 2008). The prevalence of financial abuse (economic violence) of women in this study was 5.1%. Data are very scarce to support or refute this finding. It is, therefore, no surprise to see connection between gender based abuse and depression as women who were and are still abused frequently experience depression. Women with depression should be started on a course of treatment for depression. It is very important to sensitize the society to this monstrous phenomenon through information campaigns and awareness to educate the new generation to gender equality, respect for the woman and the consequences of violence on health of victim (Maria, 2014). Involvement of civil societies, NGOs and law enforcement agents

should be included. Government should enact laws making any form of gender violence illegal and punishable too.

Intake of alcohol in pregnancy was identified as a risk factor and predictor of antenatal depression in this study. Prevalence of alcohol intake in pregnancy was 5.8% in the study. This is well within a prevalence range of 1.9% and 11% observed in a study in Lagos, Nigeria (Ezechi, 2015). Alcohol is a depressant. So, any amount of alcohol taken during pregnancy can lead to depression. No surprise that intake of alcohol in this study is a predictor of antenatal depression. Apart from depression, alcohol causes teratogenesis of the fetus, spontaneous abortion, preterm labour, low birth weight, fetal alcoholic syndrome (Ezechi, 2015). It is, therefore, necessary to embark on public health education on the effects of alcohol use in pregnancy through print, electronic media and community sensitization. There should be retraining of health workers on alcohol prevention counseling during pregnancy.

Going further, history of previous caesarian section was found to be a risk factor of AD. This is supported by a finding observed in a study in Navi Mumbai, India (Shaunak et al., 2013). The prevalence of caesarian section in this study was 2.8%. This is below the prevalence observed in another study which reported 10.4% in Awka, Nigeria (Ikeakor et al., 2010). The reason for this was some participants were recruited from health centers and maternities which offer basic obstetric care, and most had their previous deliveries in these facilities. Women who have had a surgical birth are more likely to experience feelings of loss, personal failure and low esteem (VBAC, 2014). Good supportive network that can address birth trauma issues is necessary. There is need to improve on facilities and manpower in secondary and tertiary health facilities as these will impact on the quality and safety of its services. Counseling and education of these vulnerable pregnant women on the importance of treatment of depression should be encouraged.

Another risk factor identified in this study is large family size (≥ 6 persons). This is similar to an inference made from another study on antenatal depression (Lancaster et al, 2010). The rate of large family size in the study was 17.2%. According to NDHS, the average family size in Nigeria is five persons per household (NDHS, 2003). Depression is associated with large household with pronounced gender based violence cases (Mamdouh et al., 2012). Treatment of depression is

very important for people with depression. Family planning should be introduced to them after childbirth to limit family size.

Social support and wealth index variables were not found to be significantly associated with antenatal depression in this study, but they showed important trends. Wealth index is a measure of household socioeconomic status. Prevalence of antenatal depression was found to be high with low social support and low wealth index, and it decreased gradually with increasing social support and wealth index. Other studies reported significant associations (Bronwyn et al., 2008; Lancaster et al., 2010; Emre et al., 2013).

The health seeking behaviour for antenatal depression among women with EPDS≥12 was assessed and important inferences were drawn. Most participants reported consulting their husbands/lovers about symptoms of depression (68.9%), and then followed by those who reported consulting their doctors (12.2%), family members (10.8%) and friends (5.4%). This is supported by similar findings observed in Ohio, USA in a study which reported that more depressed pregnant women consulted their family (especially their husbands and mothers) and friends about symptoms of depression than they consulted health care professionals (Henshaw et al.. 2013). Education about depression and treatment resources should be developed specifically to target social support persons especially the husband. These individuals are more likely to learn about women's symptoms than the health care provider because they are very close to these depressed women. Equipping them with knowledge about symptoms, etiology and steps for referral and support would result in women being more likely to discuss symptoms with a doctor or a nurse.

On who influenced or informed their decisions to get treated, most reported being informed by their doctors to get treated (57.3%), and then followed by those who reported having their decisions to be treated being informed by their husbands (32%), family members (6.7%) and friends (1.7%). Similar inference was made in a study in Ohio, USA, but it was reported that mothers have greatest influence on their daughter's decisions to get treatment (Henshaw et al., 2013). It is important to know depressed women are likely to look for treatment if they share their illness symptoms with doctors, husbands and to a small extent, their family members. So, equipping doctors. husbands and family members with knowledge about etiology, risk factors

and symptoms of depression through education will enable them to properly inform these women the need to get treated in the hospital.

On treatment preferences for depression, some reported going to church for prayers (52%) and some reported going to the hospital to get treated (41.3%). Only three (4%) reported self medication. The opposite inference was made in Ohio, USA by Henshaw who reported that most depressed women sought treatment in hospitals, and then followed by, in a distant second position, self treatment at home, and then seeking help in place of worship came a very distant third position (Henshaw et al., 2013). The reason for these conflicting findings might be that many women in Abeokuta, nay Nigeria are very religious. Indirect psychotherapy and social support obtained in these places of worship may be helping some women to cope with or reduce depressive symptoms. There is need to create awareness and educate clerics about depressive symptoms and dangers associated with untreated cases, and to recognize worsening depressive conditions and steps for referral to hospitals for prompt treatment.

5.1.2 Limitations of the study

The Edinburgh Postnatal Depression Scale (EPDS) is a screening tool and not a diagnostic tool. Any score equals or above 12 is only suggestive of depression. So, to confirm any case of depression, referral to a psychiatric team should be done. Therefore, there should be a team work between obstetric team and psychiatric team.

Another limitation is that it was not possible to determine causal relationships between depression and risk factors but only to determine associations. This is due to the fact that the research was a cross sectional study.

There may have been recall bias, underestimation and overestimation of some experiences reported by the respondents but this was minimized by employing them to provide truthful responses and that the information would be kept confidential and used for the purpose of the study alone.

5.2 Conclusion

In conclusion, findings in this study showed that prevalence of antenatal depression in Abeokuta North LGA was high at 24.5%. It peaked in the first trimester, and slightly decreased with increasing trimester.

Various risk factors and predictors of antenatal depression were determined, and these were attending antenatal care in public facilities, gender based abuse or violence, intake of alcohol in pregnancy, young age, premarital pregnancy, unplanned pregnancy, illiteracy, history of previous caesarian section, coexisting medical conditions and large family size.

Finally, the health seeking behaviour for antenatal depression among depressed women was determined. It was identified that involvement of clerics, husbands, family members and friends in the management of antenatal depression was necessary to curb the menace. Some recommendations were made on how to tackle antenatal depression.

5.3 Recommendations

- Government and hospital management should introduce screening for depression as part of routine antenatal assessments in both public and private health facilities. Each pregnant woman should be screened at least thrice for depression before childbirth, with one screening in each trimester
- Early registration for antenatal care especially in the first trimester should be encouraged since antenatal depression peaks in the first trimester.
- Community awareness campaigns should be embarked on by the state public health sector to educate the society on antenatal depression and its associated risk factors, dangers associated with untreated depression and the need to get prompt help.
- Counseling on alcohol prevention should be initiated in all health facilities.
- Government should enact laws making gender based violence illegal and punishable.

- There is need to create awareness and educate clerics, husbands, family members and friends about depressive symptoms and dangers associated with untreated cases, and to recognize worsening depressive conditions and steps for referral to hospitals for prompt treatment. Seminars and workshops should be organised by ministry of health for proper dissemination of information.
- Family planning should be encouraged by the doctors, especially after childbirth to avoid unplanned and unwanted pregnancy, child spacing, limit family size and prevent sexually transmitted diseases.
- Prompt treatment of co-existing medical conditions could help to reduce depressive symptoms.
- Literacy education should be initiated by the state government as this has been found to reduce depressive symptoms.
- Social support network should be established which provides an avenue for all the at-risk and depressed women to come together and share their challenges and coping mechanisms.
- Further study is recommended, especially a community based one, to determine the gravity of antenatal depression in the community as this study might have underestimated the prevalence since it was hospital based.

REFERENCES

Abera B and Demewoz H. 2015. Prevalence of antenatal depression and associated factors among pregnant women in Addis Ababa, Ethiopia: a cross-sectional study.*Biomed Central Research International* Retrieved January 2016 from europepmc>articles>PMC4627391

Abiodun O.A., Bola A. O., Olutayo O. A., Atinuke O.D. and Olubunmi O.F. 2007. Prevalence and correlates of depression in late pregnancy among Nigerian women. *Depress Anxiety* 24.1:15-24

American Psychiatric Association (APA).1994. Diagnostic and statistical manual of mental disorders. 4th ed. Washington, DC: American Psychiatric Association. Retrieved November 2015 from www.psych.org/MainMenu/Research/DSMIV.aspx

Asuquo E. E, Etuk S. J, Duke F, 2000. Staff attitude as a barrier to utilization of University of Calabar Teaching Hospital for Obstetric care. *Afr. J Reprod. Health*4:69-73

Baron E,Field S, Kafaar Z, Honikman S. 2015. Pattern of use of a maternal mental health service in a low-resource antenatal setting in South Africa. *Health Soc Care Community*23.5:502-12

Barrio L.M, Burt V.K. 2000. Depression in pregnancy: strategies for primary care management. *Women's Health Prim Care* 3: 490-8

Beck AT. 1961. An inventory for measuring depression. *Arch Gen Psychiatry* 4: 53-61

Birndorf C. A, Madden A, Portera L, Leon A. C.2001. Psychiatric symptoms, functional impairment, and receptivity toward mental health treatment among obstetrical patients. *Int J Psychiatry Med* 31: 355-65

Boyd R.C, Pearson J.L, Blehar M.C.2002. Prevention and treatment of depression in pregnancy and the postpartum period: summary of a maternal depression roundtable: a US perspective. *Arch Women Ment Health* 4: 79-82

Bronwyn L. and Jeannette M. 2008. Risk factors for antenatal depression, postnatal depression and parenting stress. *BMC Psychiatry*DOI:10.1186/1471-244X-8-24

Casper R.C, Fleisher B.E, Lee-Ancajas J.C, Gilles A, Gaylor E, Debattista A and Hoyme H.E.2003. Follow-up of children of depressed mothers exposed or not exposed to antidepressant drugs during pregnancy. *J Pediatr* 142: 402-8

CIA World Factbook. 2015. Nigeria-The World Factbook. Retrieved January 2016 from www.cia.gov>publications>geos

Committee to Study the Prevention of Low Birthweight(CSPLB).1985. Preventing low birth weight: eitology and risk factors. Washington (DC): *National Academy Press*1:46

Cochran W.G. 1963. Sampling techniques, 2nd ed., New York: *John Wiley and sons, inc.*Retrieved January 2016 from onlinelibrary.wiley.com>doi>pdf

Costei A.M, Kozer E, Ho T.2002. Perinatal outcome following third trimester exposure to paroxetine. *Arch Pediatr Adolesc Med* 156: 1129-32

Cox J.L, Chapman G, Murray D, Jones P.1996. Validation of the Edinburgh postnatal depression scale (EPDS) in non-postnatal women. *J Affect Disord* 39: 185-9

Cox J.L., Holden J.M., Sagovsky R.1987.Detection of postnatal depression: development of the Edinburgh Postnatal Depression Scale. *Br J Psychiatry* 150: 782-6

Chrousos GP, Torpy DJ, Gold PW.1998. Interaction between the hypothalamus-pituitary-adrenal axis and the female reproductive system: clinical implication. *Ann Intern Med* 129: 229-40

NICE Clinical Guideline .2009.Depression in adults: recognition and management.Retrieved November 2015 from www.nice.org.uk>guidance

Doris A, Ebmeier K and Shajahan P.1999. Depressive illness. *Lancet*354: 1369-75

Ekanem E E, Adewole I., Umoh V, Iwere N and Gbadegesin A. 2004. Community-based survey of unwanted pregnancy in southwestern Nigeria. *Afr J Reprod Health* 8(3):103-15

Emre Yanikkerem, semra Ay, Selviye Mutlu, Asli Goker. 2013. Antenatal depression: prevalence and risk factors in a hospital based Turkish sample. *J Pakistan Medical Association*63.4:472-477

Ezechi O. 2015. Alcohol use in pregnancy=preliminary result. Maternal, Reproductive and Child Health Research Group. *Nigeria Institute of Medical Research*. Retrieved January 2016 from http://nimr.gov.ng>uploads>2015/07

Fawole A, Fawole O and Kehinde I. 2008. Prevalence of violence against pregnant women in Abeokuta, Nigeria. *Aust and zea Journ Obstet Gynecol* 48.4:405-414

First M.B, Spitzer R.L, Williams J.B 2003. Structured clinical interview for DSM-IV (SCID-I) (User's Guide and Interview) Research Version. New York: *New York Psychiatric Institute*

Gavin N I, Gaynes B N, Lohr K N . 2005 Perinatal Depression: a systematic review of prevalence and incidence. *Obstet Gynecol* 10.5: 1071-1083

Gilda S, and Akinrinola B . 2006. Unwanted Pregnancy and Associated Factors Among Nigerian Women. *Int Fam Plann Pers* 32:4

Goldberg J. 2014. Coping with chronic illness and depression. WebMD LL.C. retrieved January 2016 from www.webmd.com>depression>guide

Henshaw E, Sabourin B and Warning M. 2013. Treatment-seeking behaviours and attitude survey among women at risk for perinatal depression or anxiety. *PubMed*PMID: 23374137

Hirschfeld R, Keller M, Panico S. 1997. The National Depressive and Manic-Depressive Association consensus statement on the undertreatment of depression. *JAMA* 277: 333-40

Holsboer F. 2001. Stress, hypocortisolism and corticosteroid receptors in depression: implications for therapy. *J Affect Discord* 62: 77-91

Ibukun Ogunbekun, Adenike Ogunbekun and Nosa Orobaton. 2012. Private healthcare in Nigeria: walking the tightrope. Mediplan limited Lagos, Dental General Hospital, Lagos, Nigeria. Retrieved December 2015 from docplayer.net>1032650-private-health

Ikeakor L C, Nwajiaku L, Ezegwui H U. 2010. Caesarian section in a secondary health hospital in Awka, Nigeria. Dept Obstet Gynecol,UNN. *Nigerian Medical Journal*50.3: 64-67

Karen B. 2009. Stress and Depression: Can stress cause antenatal depression? WebMD. Retrieved January 2016 from www.webmd.com>depression>features

Kelly RH, Russo J, Katon W.2001. Somatic complaints among pregnant women cared for in obstetrics: normal pregnancy or depressive and anxiety symptom amplification revisited? *Gen Hosp Psychiatry* 23: 107-13.

Kilma C. 1998. Unintended Pregnancy: consequences and solutions for a worldwide problem. *Journ Nur Midwif* 53:108-115

Lancaster CA, Gold KJ, Flynn HA. 2010. Risk factors for depressive symptoms during pregnancy: a systematic review. *Am J Obstet Gynecol*Jan;202.1:5-14

Lee A and Lam S. 2007. Prevalence, course and risk factors of antenatal anxiety and depression. *Obstet Gynecol*, volume 110.5: 1102-1112.

Lepine JP.2001. Epidemiology, burden, and disability in depression and anxiety. *J Clin Psychiatry* 62: 4-10Lesser J, Anderson N. L., Komak-Griffin D. 1998. "Sometimes you don't feel ready to be an adult or a num". The experience of adolescent pregnancy. *J Child Adolesc psychiat Nurs.*

Mamdouh H.M, Ismail H.M, Kharboush I.F, Tawfik M.M, El Sharkawy O.G, Abdel-Baky M. and Sallam H.N. 2012. Prevalence and risk factors for spousal violence among women attending health care centres in Alexandria, Egypt. *Eastern Mediterranean Health Journal* 18:1

Manikkam L, Burns JK. 2012. Antenatal Depression and its risk factors: an urban prevalence study in KwaZulu Natal. *S Afr Med J* 10.2:940-944

Mannava k, Durrant K, Fisher J, Cherish M and Luchters S. 2015. Attitude and behaviour of maternal health care providers in interaction with clients. *Global Health Journal* 11.1:36

Maria R J. 2014. The presence of depression in women who are victims of violence. The experience of anti violence centers in the region of Calabria. *Psychiatria Danabina* vol.26.1: 97-102

McElhatton P. R, Garbis H. M, Elefant E. 1996.The outcome of pregnancy in 689 women exposed to therapeutic doses of antidepressants: a collaborative study of the European network of Teratology Information Services (ENTIS). *Reprod Toxicol* 10: 285-94

Michael A., MarySue V.H, Eve F, Alfonso A, Faustin N, and Magine C. 2008. Intimate Partner violence, depression and PTSD among pregnant Latina women. *Am Fam Med*

Mohammad-Yusuff A. S,Tang L. 2015. Prevalence of antenatal depressive symptoms among women in Sabah,Malaysia. J *Maternity Fetal Neonatal Med*. 19:

Murray D, Cox J. L.1990.Screening for depression during pregnancy with the Edinburgh depression scale (EPDS). *J Reprod Infant Psychol* ; 8: 99-107

Nigeria Demographic and Health Survey (NDHS) 2003. Calverton: National Population Commission and ORC Macro. Retrieved www. Dhsprogram.com>pubs>pdf

National Institute of Aging (NIA). 2015. Menopause. Retrieved January 2016 from www.nia.nih.gov>publication

National Literacy Survey. 2010. Nigeria Bureau of Statistics. Retrieved December 2015 from www.nigerianstat.gov.ng>download

National Population Commission (NBC). 2006. Population distribution. Retrieved January 2016 from www.population.gov.ng

Nordeng H, Lindemann R, Perminov KV.2001. Neonatal withdrawal syndrome after in utero exposure to selective serotonin reuptake inhibitors. *Acta Paediatr* ; 90: 288-91

Nulman I, Rovet J, Stewart D.2002. Child development following exposure to tricyclic antidepresants or fluoxetine throughout fetal life: a prospective controlled study. *Am J Psychiatry*159: 1889-95

Osita S. U, Joseph I. I. 2013. The prevalence of HIV sero-positivity in late pregnancy among antenatal attendees with seronegative status in first half of pregnancy in Nnewi, South East Nigeria.. *Journ HIV hum reprod*1.1:25-29

Pajulo M, Savonlahti E, Sourander A.2001. Antenatal depression, substance dependency and social support. *J Affect Disord* 65: 9-17.

Pereira P. K., Giovanni M. L., Daniel L. P., Lúcia A. L., Leticia F. L.2009. Depression during pregnancy: prevalence and risk factors among women attending a public health clinic in Rio de Janeiro, Brazil. Cad. *Saú de Públ ica* 25:12

Radloff LS.1977. The CES-D scale: a self-report depression scale for research in the general population. *Appl Psychol Measure* 1: 385-401

Ragg Rachel (3 October 2012). "The agony of PRE-NATAL depression: It strikes one in eight pregnant women, but many of us don't even know it exists". Mail (London). Retrieved 2015-09-21.

Ricardo S, Jansen K2012. Sociodemographic risk factors of perinatal depression:a cohort study in the public health care system. *Revista Brasileira de Psiquiatria*34:2

Rochat T. J, Tomlinson M,. 2013. Detection of antenatal depression in rural HIV-affected populations with short and ultrashort versions of Edinburgh Postnatal Depression Scale. *Arch Women's Mental Health*16.5: 401-410

Saifudden Ahmed. 2009. Methods in Survey Sampling. John Hopkins Bloomberg School of Public Health. Retrieved January 2016 from ocw.jhsph.edu

Salamero M, Marcos T, Gutierrez F. 1994. Factorial study of the BDI in pregnant women. *Psychol Med* ; 24: 1031-5

Sarason I G, Levine H M, Basham R B and Sarason B R. 1983. Assessing social support: The Social Support Questionnaire. *Journal of Personality and Social Psychology*, 44.1: 127-139

Sawyer A, Ayer S and Smith H. 2010. Pre- and postnatal psychological wellbeing in Africa: a systematic review. *Journal of Affective Disorders* 123: 17-29

Shakeel N, Eberhard-Gran M, Sletner L, Shining K, Martinsen E.W, Holme I, et al. 2015. A prospective cohort Study of depression in pregnancy, prevalence and risk factors in a multi-ethnic population. *BMC Pregnancy Childbirth*www.ncbi.nih.gov> PMC4310137

Sharp L. K, Lipsky M. S. 2002. Screeiúng for depression across the lifespan: a review of measures for use in primary care settings. *Am Fam Physician* 66: 1001-8

Shaunak A., Pradeep R. J, Nimisha N S. 2013. Depression during pregnancy: prevalence and obstetric risk factors among pregnant women attending a tertiary care hospital in Navi, Mumbai. *Industrial Psychiatry* ,22.1:37-40

Simon G. E, Cunningham M. L, Davis R. L.2002. Outcomes of prenatal antidepressant exposure. *Am J Psychiatry* ; 159: 2055-61

Spinelli M.G, Endicott J.2003. Controlled clinical trial of interpersonal psychotherapy versus parenting education program for depressed pregnant women. *Am J Psychiatry*160: 555-62

Spitzer R. L, Kroenke K, Willaims J. B.1999. Validation and utility of a self-report version of PRIME-MD: the PHQ Primary Care Study. *JAMA*;282: 1737-44

Spitzer RL, Williams JB, Kroenke K2000. Validity and utility of the PRIME-MD patient health questionnaire in assessment of 3000 obstetric-gynecologic patients: the PRIME-MD patient health questionnaire obstetrics-gynecology study. *Am J Obstet Gynecol* 183: 759-69

Stewart RC, Umar E. 2014. A cross-sectional study of antenatal depression and associated factors in Malawi. *Arch Women's Mental Health*17.2:145-154

Sturm R, Wells KB. 1995. How can care for depression become more cost-effective? *JAMA* 273: 51-8

Swati S, Ekele B A. 2014. Hypertensive disorders in pregnancy among pregnant women in a Nigeria in a Teaching Hospital. *Niger Med J*: 55.5: 384-388

The World Bank. 2015. Adolescent fertility rate (births per 1000 women ages 15-49 years). Retrieved January 2016 from http:// data.worldbank.org/indicators/SP-ADO.TFRT/countries

The World Health Organisation (WHO). 2015. Adolescent pregnancy. Retrieved January 2016 from www.who.int/mediacentre/factsheets/fs364/en/

World Health Organization, 2004, update(2008). The global burden of disease. Retrieved December 2015 from www.who.int>2004_report_update

Thorpe L, Whitney DK, Kutcher SP.2001. Clinical guidelines for the treatment of depressive disorders: VI. Special populations. *Can J Psychiatry* 46: 647-768

Tripod. Local Governments In Ogun States. Retrieved October 2015 from http://ogunstatebiz.tripod.com/adoodootalocalgovemment/id9.html

Tylee A.2000. Depression in Europe: experience from the DEPRES II survey. *Eur Neuropsychopharmaco;* 10: S445-8

US Department of Health and Human Services, Public Health Service, and Agency for Health Care Policy and Research. Depression Guideline Panel.1993. Depression in primary care: volume 1: detection and diagnosis. Clinical Practice Guideline, No. 5. Rockville (MD): *AHCPR. Publication* No. 93-0550

VBAC.com. 2014. Caesarian Section and Birth Trauma. Retrieved January 2016 from www.vbac.com>caesarian-section-and-bi...

Verreault N, Da Costa D, Drista M, Ireland K, Merchand A, Khalife S. 2014. Rates and risk factors associated with depressive symptoms during pregnancy and with postpartum onset. *J Psychosom Obstet Gynaecol*: 35.3:76-91

Vintzileos A, Ananth CV, Smulian CV.2002. The impact of prenatal care in the United States on preterm births in the presence and absence of antenatal high-risk conditions. *Am J Obstet Gynecol*187.5:1254-1257

Weiss B D, Francis L, Sent J H, Heist K Hargarves R. 2007. Does literacy education improve symptoms of depression and self-efficacy in individuals with low literacy and depressive symptoms? A preliminary investigation. *J Am Board Fam Med* 20.1:23-27

Weobong B, Soremekun S, Augustinas H.A.A, Manu A.A, Owusu-Agyei S, Prince M, et al. 2014. Prevalence and determination of antenatal depression among pregnant women in a predominantly rural population in Ghana: the DON population-based study. *J Affect Discord.* Retrieved January 2016 from www.ncbi.nlm.nih.gov>PMC4280205

WHO. 2015. Adolescent pregnancy. Retrieved January 2016 fromwww.who.int/material_child adolescent/topics/maternal/adolescent pregnancy/en/

Wilusz MJ, Peters RM, Cassidy-Bushrow AE.2014. Course of depressive symptoms across pregnancy in African American women. *J Midwifery women's Health*59.4:411-416

Wokoma F S, Celestine T J, Enyinda C E. 2001. Gestational Diabetes Mellitus in A Nigerian Antenatal Population. *Trop Journ Obstet Gynecol* 18.2: 56-60

Zeng Y, Cui Y, Li J.2015. Prevalence and predictors of antenatal depressive symptoms among Chinese women in their third trimester: a cross-sectional survey. *BMC Psychiatry*Retrieved January 2016 from BiomedCentral>bmcpsychiatry>articles> PMC43875591

Appendix 1

QUESTIONNAIRE

PREVALENCE OF ANTENATAL DEPRESSION AND THE ASSOCIATED RISK FACTORS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINICS IN ABEOKUTA NORTH LOCAL GOVERNMENT AREA, OGUN STATE

Dear Respondent,

My name is Thompson, Okechukwu. I am currently a postgraduate student of Epidemiology and Medical Statistics of Faculty of Public Health, College of Medicine, University of Ibadan. I am undertaking this study to find out how pregnant women are coping with pregnancy psychologically and see if any of them are experiencing disturbances in sleep and loss of interest in their routine activities during pregnancy, the causes of these changes and how they seek help.

The research is a requirement for the fulfilment of the award of the degree of Masters in Public Health in Field Epidemiology of the University of Ibadan.

Your sincere response is encouraged as participation in this study is voluntary, absolute anonymity and confidentiality shall be maintained and the information provided will only be used for the research purpose.

Consent: Now that the study has been well explained to me and I fully understand the content of the study, I will be willing to take part in this research.

Signature/Thumbprint of Participant

Interview Date

Thanks

SITE: _____

SERIAL NO:

INTERVIEWER: _____

_____

Section A: SOCIO-DEMOGRAPHIC CHARACTERISTICS

TICK THE OPTION OR WRITE AS APPROPRIATE WHICH APPLIES TO YOU BESIDE THE QUESTION

1. Age
2. Marital status 1. Single 2. Married 3. Separated 4.Divorced 5. Widowed
3. Ethnicity 1. Yoruba 2.Igbo 3.Hausa 4. Other (specify)
4. Level of Education 1.Primary 2. Secondary 3. Tertiary 4. None
5. Family size
6. Type of family 1. Monogamous 2. Polygamous 3. Others
7. If polygamous, how many wives
8. What is your position among the wives?
9. Occupation
10. Monthly income/earning

Appendix I cont'd

11. Husband's occupation

12. Husband's income/earning

13. **Tick the ones that apply to you:** 1. I live in a concrete house 2. I live in Mud house 3. I have television 4. I have refrigerator 5. I have a car(cars) 6. I have tables and chairs in my house 7. I have a bed 8. I use electricity in my house 9. I rear goats, sheep and/or chickens 10. I cook with stove 11. I cook with gas cooker 12. I cook with firewood

OBSTETRIC HISTORY

Index (Current) Pregnancy

14. Last menstruating period

15. Age of pregnancy (In months)

16. Expected date of delivery

17.(a) Was the pregnancy expected (planned)? 1. Yes 2. No

(b)How long did you wait since your last pregnancy? (In years)

History Of Co-Existing Medical Conditions

18. Hypertension 1. Yes_____2 No_____
19. Diabetes 1. Yes_____ 2 No_____
20. HIV 1 Yes_____2 No_____
21. Others _____ (specify)

Past Obstetric History

22. Gravidity (the number of times you have been pregnant)

23. Parity (the number of times you have given birth to a live baby or stillbirth above 28 weeks)

24. How many miscarriages/abortions have you had?

Previous Pregnancies History

S/N	Birth Date	Due Date	Weight	Sex (Child)	Type of Delivery (CS or Vaginal)	Breastfed (Yes orNo)	Complications
25							
26							
27							
28							
29							
30							

SOCIAL HISTORY

Cigarette Smoking:

Appendix I cont'd

31. Do you smoke cigarette in this pregnancy? 1. Yes 2. No

(If No, skip to36)

32. ***If Yes to question 31,*** When was the last time you smoked?

33. During the last 30 days, on how many days have you smoked?

34. How many cigarette a day do you smoke?

35. Why are you smoking cigarette in this pregnancy?

_____

_____

_____

36. Do you believe that smoking could be harmful to your pregnancy? 1.Yes 2. No 3. I don't know

Do you currently use any of the following tobacco products?

S/N	Tobacco Products	1. Yes	2.No
37	Chewing tobacco or snuff		
38	Tobacco gum		
39	Tobacco patch		

HISTORY OF ALCOHOL INTAKE

40. Do you drink beer, wine or spirit/liquor in this pregnancy? 1.Yes 2. No

(If No, skip to 44)

41. What alcohol do you take? 1. Beer 2 Wine 3 Spirit 4 Herbs5 Others(specify)

42. ***If Yes to Question 40,*** When was the last time you drank beer,wine or spirit/liquor?

43. Why are you drinkingalcohol during this pregnancy?

_____

_____

_____.

44. Do you believe that drinking beer, wine, spirit or liquor could harm your pregnancy? Yes No

HISTORY OF SOCIAL SUPPORT

Please tick appropriately. Multiple answers are allowed.

Appendix I cont'd

S/N	Questions	Family	Friends	Husband/Lover	Neighbour/ Colleague	None
45.	Who is/are around to help when you are in need?					
46.	With whom do you share joy and sorrow?					
47.	From whom do you count on when things go wrong?					
48.	Who do you get your emotional help and support you need from?					
49.	Who is/are your real source (s) of comfort?					

50. Have you ever experienced any of these from your husband/lover/male partner? 1. Rape 2. Physical assault 3. Intimidation/threat 4. Inadequate financial support

51. In the last 9months, How many times did you experience any of the selected options in question 50?

52. How was your Childhood experience? 1. Pleasant 2. Unpleasant 3. I don't know

53. If pleasant or unpleasant, describe your experience

_____

_____

_____

SECTION B: EDINBURGH POSTNATAL DEPRESSION SCALE

This is a 10-question self-rating scale. Please circle the answer that comes closest to how you have felt in the past 7 days:

54. I have been able to laugh and see funny side of things

0. As much as always could
1. Not Quite so much now
2. Definitely not so much now
3. Not at all

55. 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

56. I have been anxious or worried for no good reason

0. No, not all

1. Hardly ever

2. Yes, Sometimes

3. Yes, very often

57. I have blamed myself unnecessarily when things went wrong

0. No, never

1. Not very often

2.Yes, some of the time

3. Yes, most of the time

58. I have felt scared or panic for no very good reason

0. No, not at all

2. Yes, sometimes

Appendix 1cont'd

1. No, not much

3. Yes, quite a lot

59. Things have been getting on top of me*(Unable to cope with conditions)*

0. No, I have been coping as well as ever coping as well

2. Yes, sometimes I have not been usual

1. No, most of the time I have coped quite well 3. been able to co

3. Yes, most of the time I have not at all

60. I have been so unhappy I had difficulty sleeping

0. Not at all

2. Yes, sometimes

1. Not very often

3. Yes, most of the time

61. I have felt sad or miserable

0. No, not at all

2. Yes, quite often

1. Not very often

3. Yes, most of the time

62. I have been so unhappy that I have been crying

0. No, never

2. Yes, quite often

1. Only occasionally

3. Yes, most of the time

63. The thought of harming myself have occurred to me

0. Never

1. Hardly ever

2. Sometime

3. Yes, quite often

SECTION C: HEALTH SEEKING BEHAVIOUR*(Please circle the option that applies to you)*

64. When you are sad or lose interest in your routine activities, who do you consult? (a) Friends (b) Family (c) doctors (d) Husband/Lover (e) Others

65. What form of treatment or help do you seek when you are sad for over one week?

(a)Hospital treatment (b) Tradomedical treatment (c) Prayer in the church (d) Self-medication(e) No treatment

66. Who informs the decision you take to get treated? (a) Friends (b) Family (c) doctors (d) Husband/Lover (e) Others

Appendix 2 cont'd

AWON IBEERE

IWADI LORI I BI IREWESI NINU OYUN SE PO TO ATI AWON OHUN TI O NSE OKUNFA RE LAARIN AWON ALABOYUN TI O N LO SI ILE IWOSAN ALABOYUN NI IJOBA IBILE ARIWA ABEOKUTA, IPINLE OGUN.

Oludahun Owon,

Oruko mi ni Thompson Okechukwu. Lowolowo, mo nkeko siwaju si ni eya Epidemiology and Medical Statistics ti Abala ti o n mojuto eto ilera gbogboogbo ni Unifasiti Ibadan. Mo n se iwadi lorii bi awon alaboyun se n farada awon ihuwasi ti o ma n je yo latari oyun nini ati lati mo boya okankan ninu won ma n ni idiwo ti o ba fe sun ati wipe boya awon ohun ti won ma n se deede ko wu won n se mo latari oyun nini, awon ohun ti o n fa awon iyipada yi ati bi won se n bere fun iranlowo.

Iwadi yi je ara awon ohun ti a bere fun lati gba ami eye Masters in Public Health and Epidemiology ni Unifasiti Ibadan.

Ako mu enikeni ni dandan lati ko pa ninu iwadi yi, nitorina gbiyanju lati fi idahun ti o to si awon ibeere yi. Enikeni ko ni anfani lati ri mo ni pato eniti o dahun awon ibeere yi bi o ti je wipe a ko ni lo oruko enikeni iwe ibeere,awon idahun re yi o si je lilo fun eto iwadi nikan.

Mo gba: a ti se alaye iwadi yi fun mi dada o si ye mi yekeyeke gbogbo ohun ti o da le lori. Mo gba lati kopa ninu iwadi yi.

---------- ----------

Onte Ojo iwadi

O seun.

IBI IWADI: _____

OLUWADI: _____ **NOMBA NI SISE N TELE:** ____

APA KINNI: AWON OUN TI O NI I SE PELU IGBEAYE KAARI AWUJO (Fa ila si tabi ko idahun ti o jemo ibeere kookan)

1.	Ojo ori	----------
2.	Ipo re gege bi obirin	1. Omidan _____ 2. Mo ti se igbeyawo _____ 3. Nko gbe pelu oko mi _____ 4. Mo ti pinya pelu oko mi _____ 5. Oko mi ti se alaisi _____
3.	Eya	• Yoruba _____ • Igbo _____ • Hausa _____ • Omiran (so ni pato) _____
4.	Ipele iwe kika	• Alakobere _____ • Girama _____ • Ile iwe giga _____ • Ko si _____

Appendix 2 cont'd

5.	Eniyan to wa ninu ebi	_____
6.	Iru idile wo lo o ni	• Oniyawo kan _____ • Oniyawo meji tabi ju be e lo _____ • Omiran (so ni pato) _____
7.	Ti o ba je oniyawo meji tabi ju beelo, iyawo melo ni?	_____
8.	Kini ipo re larin awon iyawo?	_____
9.	Iru ise wo lo n se?	_____
10.	Elo ni o n pa tabi gba losoosu?	_____
11.	Ise kini oko re nse?	
12.	Elo ni o n pa tabi gba losoosu?	_____

13. E fagi si eyi ti o bajemo tiyin ninu awon ibeere wonyi: 1. Mo ngbe ni ile ti won fi buloku ko 2. Mo ngbe ni ile ti won fi amok o 3. Moni ero Amounmaworanile 4. Moni ero amo mi tutu 5. Moni okoo ayokele 6. Moni aga ati tabili ninu ile mi 7. Moni Ibusun 8. Mo nlo ina ijoba ni inu ile mi 9. Mo nsin awon eran osin bi ewure, aguntan,tolotolo ati bee lo 10. Sitoofu ni mo fi n dana 11. Mo nfi gaasi dana 12. I gi ni mo fi n dana

IBEERE NIPA OYUN ATI AWON OUN TI O RO MO

Oyun ti o ni lowolowo

- Nkan osu ti o se gbeyin _____
- Osu melo ni oyun re? _____
- Ojo ti o ro lati bimo _____
- (a) nje o reti oyun yi (Ii eto si) (1) Beeni_____ (2) Beeko_____

  (b) odun melo ni o reti oyun yi leyin oyun ti o ni keyin? _____

Ibeere lori awon aisan ti o wa pelu oyun

- Eje riru (1) Beeni_____ (2) Beeko_____
- Ito suga (1) Beeni_____ (2) Beeko_____
- HIV(Arunkogbogun) (1) Beeni_____ (2) Beeko_____
- Omiran (so ni pato) _____

Ibeere lori oyun ati awon oun ti o ro mo ti o ti ni seyin

- Iye igba ti o ti loyun ri _____
- Igba melo ni o ti bi mo ri yala ni ayc tabi okumo? _____

- Oyun melo ni o ti yo tabi baje mo o lara? _____

Ibeere lori awon oyun ti o ti ni seyin

S/N	Ojo ibi	Ojo ti o bi mo	Iwon ni wiwon	Omo (okunrin tabi obirin)	Iru bi o se bimo (abe tabi oju ara)	Se fun won loyan (Beeni abi Beeko)	Awon wahala ti o je yo
25							
26							
27							

Appendix 2cont'd

28							
29							
30							

IBEERE NIPA IGBEAYE RE OJOJUMO

Siga mimu

31. Nje o n mu siga ninu oyun ti o ni yi? (1) Beeni_____ (2) Beeko_____
32. Bi beeni si ibeere 31, igba wo ni o mu siga gbeyin? _____
33. Ni aarin ogbon ojo seyin, ojo melo ni o ti mi siga? _____
34. Siga melo ni o ma n mu ni ojo kan?
35. Kini idi ti o n fi mu siga ninu oyun yi? _____
36. Nje o gbagbo wipe siga mimu le se ijamba fun oyun re? (1) Beeni_____ (2) Beeko_____

Nje o n lo eyikeyi ninu awon nkan ti a fi taba se wonyi lowolowo?

S/N	Ohun ti a fi taba se	• Beeni	• Beeko
37.	Jije taba tabi kanna(fasimu)		
38.	Goomu ti a fi taba se		
39.	Awotele ti a fi taba se		

Ibeere lori oti mimu

40. Nje o ma n mu bia, waini tabi ogogoro/oti lile ninu oyun yi? (1) Beeni_____ (2) Beeko_____
(Ti o baje beeko, e fo lo si nomba 44)
41. Iru oti wo ni o ma n mu? 1. Bia _____ 2. Waini _____ 3. Ogogoro _____ 4. Ewe ati egbo _____ 5. Omiran (so ni pato) _____
42. Bi beeni si ibeere 40, igba wo ni o mu bia, waini, tabi ogogoro/oti lile gbeyin? _____
43. Kini idi ti o fi n mu oti ninu oyun yi? _____
44. Nje o gbagbo wipe mimu bia, waini, ogogoro tabi oti lile le se ijamba fun oyu re? (1) Beeni_____ (2) Beeko_____

Ibeere lori i iranwo lati odo awon ore/ afenifere

Mu idahun ti o ba ibeere lo. O le mu ju idahun kan lo.

S/N	Ibeere	Ebi	Awon Ore	Oko/Ololufe	Alajogbe/Alajosise	Kosi

45.	Ta ni o wa pelu re lati ran o lowo ti o ba nilo ohunkoun?					
46.	Tani e jo ma n dunnu tabi banuje?					
47.	Ta ni o le gbarale ni akoko ti nkan ba yiwo?					
48.	Nibo ni o ti ma n gba iranwo ati iduroti ti o nilo nigbati la awon nkankan koja?					
49.	Tani/awon wo ni orison itunu re ti o daju?					

50. Nje o ti la eyikeyi ninu awon nkan wonyi koja yala lati odo oko/ololufe/orekunrin re? 1. Ifipa bani lo po _____
2. Nina _____ 3. Kikonilayaje _____ 5. Aini eto isunna tio kun oju osuwo _____

Appendix 2cont'd

51. Ninu osu mesan seyin, igba melo ni o koju okankan ninu awon idahun re si ibeere 50? _____
52. Bawo ni o se le e so ohun tio la koja gege bi odomode? 1. O dara_____ 2. Ko dara_____ 3. Nko mo _____
53. Yala o dara tabi ko dara, salaye ohun ti o la ko ja? _____

APA KEJI: OSUNWON EDINBURG FUN IREWESI LEYIN OMO BIBI

Eyi je osunwon ara eni onibeere mewa. Yi odo si idahun ti o ba sunmo bi oun ti o la koja larin ojo meje seyin.

54. Mo ti le e rerin ati wipe mo ti ri awon oun ti o n pani lerin ninu awon nkan.
    0. Bi o ti se po to ni gbogbo igba
    1. Ko po to bi o ti ye lowolowo
    2. Dajudaju, ko ti le po
    3. Ko waye rara
55. Mo n woye/reti awon nkan pelu igbadun .
    0. Bi mo ti se tele ri
    1. Kere ju bi mo ti ma n se teletele
    2. Dajudaju, o ti wale ju bi mo ti ma n se tele
    3. O nira patapata
56. Mo n se aniyan laini idi ti o dara Kankan
    0. Rara, paapaa
    1. Ko sele ri
    2. Beeni, ni awon igba die
    3. Beeni, le e kookan
57. Mo tidara mi lebi lainidi nigba ti nkan ba yiwo
    0. Beeni, ni opo igba
    1. Beeni, ni awon igba die
    2. Ki I se le le e kokan
    3. Rara, lailai
58. mo ti beru tabi jaya lainidi kankan pato
    0. Rara, ko sele ri
    1. Rara, ko po
    2. Beeni, ni awon igba kookan
    3. Beeni, lopolopo
59. Awon nkan ti n ka mi laya (aini agbara lori awon oun ti o n sele)
    0. Rara. mo n kapa awon nkan bi mo ti m an se tele
    1. Rara, ni opo igba mo ti kapa won daadaa
    2. Beeni, nko le kapa won bi ti tele
    3. Beeni, ni opo igba nko tile le kapa won
60. Inu mi ko dun, o nimi lara lati sun
    0. Ko seleri
    1. Ki I se ni gbogbo igba
    2. Beeni, ni awon igba kookan
    3. Beeni, ni opo igba
61. Mo ti ni ibanuje okan tabi banuje
    0. Ko seleri
    1. Ki I se ni gbogbo igba
    2. Beeni, ni awon igba die
    3. Beeni, ni opo igba
62. Inu mi ti baje de ibi wipe mo ti n sukun
    0. Rara, lailai
    1. Le ekookan
    2. Beeni, ni awon igba die
    3. Beeni, ni opo igba
63. Mo ti gbero lati se ara mi ni ijamba

0. Lailai
1. Ko le sele lailai
2. Ni igba kookan
3. Beeni, ni awon igba die

APA KETA: WIWA ILERA PIPE (mu idahun ti o ba je mo o)

64. Ti inu re ba baje tabi ti o ko ni iwura lati seawon ohun ti o ma nse, tani o ma n so fun? (a) awon ore (b) Ebi (c) Dokita (d) Oko/Ololufe (e) Omiran (so ni pato) ----------

65. Iru itoju tabi iranlowo wo ni o ma bere fun nigbati inu re ba baje fun bi ose kan seyin? (a) itoju lati ile iwosan (b) Itoju tewetegbo (c) Adura ni ile ijosin awon onigbagbo (d) Itoju ara eni (e) Ko si itoju

66. Ta ni o ma n se ipinu lori I bi o se n gba itoju? (a) Awon ore (b)Ebi (c) Dokita (d) Oko/Ololufe (e) Omiran (so ni pato) _____

Appendix 3

MINISTRY OF HEALTH

DEPARTMENT OF PLANNING, RESEARCH & STATISTICS

ABEOKUTA, OGUN STATE, NIGERIA

Ref. No. MH/PRS/237/74 Date 24/5/15

[illegible]

[illegible]

Department of Epidemiology & Medical Statistics

[illegible]

Re: PREVALENCE OF ANTENATAL DEPRESSION AND THE ASSOCIATED RISK FACTORS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINICS IN ABEOKUTA NORTH LOCAL GOVERNMENT AREA, OGUN STATE

Notice of Research Exemption

This is to inform you that the activities described in the submitted protocol / documents have been reviewed and the State Health Research Ethics Committee has determined that according to the State Code for Health Research Ethics, the activities described there-in meet the criteria for exemption and is therefore approved as exempt from SHREC oversight.

The State Code for Health Research Ethics requires you to comply with all international guidelines, rules and regulations and with the tenets of the Code. The HREC reserves the right to conduct compliance visit to your research site without previous notification.

Oladeinde

Dr. Ranti Oladeinde B.Sc, MBBS, MPH, PGDIMOT, FMCPH, MNIM,
Director Planning, Research and Statistics,
Secretary, State Research Ethics Committee