AN ASSESSMENT OF PRE-ECLAMPSIA SCREENING SERVICES DURING ANTENATAL CARE VISITS AT BUNGOMA COUNTY REFERRAL HOSPITAL, KENYA

BY

JANEPHER NAMAROME MASAI

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DECLARATION

Declaration by the student

I hereby declare that this thesis is my original work and has not been presented for an award of a degree or academic credit in any other university. No part of this work can be reproduced or transmitted in any form without prior written permission from the author or Moi University

Janepher Namarome Masai

ADM.NO: SN/PGMNH/06/12

Sign…….....Date.....

.....

Declaration by the supervisors

This thesis has been submitted to the School of Nursing with our approval as university supervisors:

Dr. Dinah Chelagat

Department of Midwifery and Gender

Sign……..Date……

Professor Lameck Diero

Department of Medicine

Sign….....Date……..

DEDICATION

I dedicate this work to all persons who have committed their lives towards the improvement of maternal and neonatal care. By their efforts, they bring joy to the families.

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LIST OF ABBREVIATIONS

ANC: Antenatal Care

BCRH: Bungoma County Referral Hospital

BMI: Body Mass Index

E.D.D Expected Date of Delivery

FANC: Focused Antenatal Care

HELLP: Hemolysis, Elavated Liver enzymes, Low Platelets

IREC: Institution Research and Ethical Committee of (Moi University & MTRH)

KDHS: Kenya Demographic and Health Survey

L.M.P: Last Menstrual Period

MCH: Maternal and Child Health

MDGs: Millennium Development Goals

MOMS: Ministry of Medical Services

MOPHS: Ministry of Public Health and Sanitation

PE: Pre-eclampsia

RMBH: Riley Mother and Baby Hospital

SDGs Sustainable Development Goals

SOM: School of Medicine

SON: School of Nursing

SPA: Provider Service Assessment

UNFPA: United Nations Population Fund

UNICEF: United Children Fund

WHO: World Health Organization

OPERATIONAL DEFINITION OF TERMS

An individual ANC client card/booklet: is a special card that is used to monitor maternal and fetal condition during pregnancy and to keep track of the care given, designed by the Ministry of Health, Kenya

Early booking: Attendance of antenatal clinic during the first trimester/early pregnancy- < 16 weeks

Hypertension: raised blood pressure of 140/90mmHg or more on two occasion six hours apart, or diastolic of 110 mmHg or more on a single occasion

Late booking: attendance of antenatal clinic during second and third trimester

Pre-eclampsia: A peculiar pregnancy condition that occurs after 20 weeks gestation, characterized by raised blood pressure and proteins in the woman's urine

Pre-eclampsia screening services: Aspect of carrying out the specific antenatal activities to identify expectant women at risk for preeclampsia.

Proteinuria: presence of proteins in the urine of 0.3g/l or more in at least two random urine specimen collected six hours apart or urine dipstick findings of trace,+1, or more of proteins

Skilled birth attendant: Medical Officer /Consultant/ Nurse/ Midwife/clinical officer offering MNH service.

Stratum: The antenatal visits were categorized into either first, second, third or fourth referred to as stratum.

Subsequent visit: Refers to second, third or fourth visit

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ABSTRACT

Introduction. Half a million women die annually during pregnancy and childbirth. Of the estimated 536000 maternal deaths worldwide, 99 % occur in developing countries. Pre-eclampsia (PE) accounts for 50,000 deaths annually, mostly preventable. Concerted efforts are required for effective decline in maternal and perinatal death. Effective screening for PE services is an excellent way of reducing maternal and neonatal morbidity and mortality.

Specific Objectives: To establish the PE screening services among women attending Antenatal Clinic (ANC) in Bungoma County Referral Hospital (BCRH), to determine the distribution for PE screening services offered to expectant mothers across the Focused Antenatal Clinic (FANC) visits and to identify the factors influencing provision of PE screening services in BCRH.

Materials and Methods: This was a descriptive cross-sectional study, involving 282 stratified randomly selected antenatal mothers and all midwives (11) in Maternal Child Health/Family Planning (MCH/FP). Data collection was by semi structured interviewer administered questionnaire and checklist. Statistical techniques like mean, standard deviation and ANOVA and Statistical package for Social sciences (SPSS V.20) were used. Results were considered significant at $\alpha=0.05$

Key findings. The PE screening services offered included: history of twins (88%), blood pressure (BP) monitoring (99%) and smoking (0.8%). The distribution of the PE screening services decreased with subsequent FANC visit respectively (39.5%, 29%, 19.5% and 12%). Screening for PE was mainly influenced by midwife's working experience, atleast five years of working (54%), ($F=17.165$, $p=0.004$), increased workload (54.5%) and inadequate equipment – BP machines (45%).

Conclusion: PE screening services are offered to pregnant women attending ANC in BCRH and the very services reduce across the FANC visits respectively. PE screening was affected by: inadequate equipment (BP machines), increased work load and experience of midwives.

Recommendations. BCRH should post adequate experienced midwives in MCH /FP, who should ensure effective screening for PE across all the FANC visits. The hospital management should further equip the facility with functional BP machines and dipsticks, for effective PE screening.

CHAPTER ONE

INTRODUCTION

1.1 Background information

Half a million women die each year during pregnancy or childbirth (Duley, 2009). Of the estimated total 536,000 maternal deaths worldwide in 2005, middle and low income countries account for 99% (WHO, UNICEF, UNFPA & World Bank, 2007). According to Say, Chou, Gemmill, Tunçalp, Moller, Daniels, Gülmezoglu, Temmerman, & Alkema, (2014) 287, 000 maternal deaths occurred in 2010, most which were in the Low and middle income countries, were avoidable. Most deaths are in developing countries where maternal mortality ration is about fourteen times higher than in developed regions (United Nations, 2015). Surprising enough most of these deaths are preventable (*ibid*). Globally maternal mortality rate has reduced at an average of less than 1% annually between 1990 and 2005, far below the 5.5 % annual decline, that was deemed necessary to achieve Millennium Development Goal (MDGs) four and five(WHO, *et al.,* 2007) (Now the Sustainable Development Goal 3). The SDG 3.1 and 3.2 aim at reduction of maternal mortality ratio by 70 per 100,000 live birth and prevent death in new born and under fives by 2030 (Osborn, Cutter & Ullah, 2015). Despite the progress in achievement of the MDGs, every day hundred of women die during pregnancy and child birth related complications (United Nations, 2015). Achieving the MDGs 4 & 5, it will require increasing attention to improved health care for women (WHO, *et al.,* 2007).

Preeclampsia is among the hypertensive diseases of pregnancy, which are an important cause of severe morbidity, long term disability and death among both mothers and their babies (WHO, 2010).

Pre-eclampsia accounts for maternal and perinatal morbidity and mortality Worldwide and it is more pronounced in middle and low income countries (Osungbade & Ige, 2011).

Pre-eclampsia is a disorder occurring in pregnant women who had normal blood pressure before 20 weeks gestation and it is characterized by raised blood pressure of or more than 140/90 mmhg on two successful measurements four to six hours apart and proteinuria (National Guidelines for Obstetrics and Neonatal Care, 2010). Pre - eclampsia is a common disorder, unique to human pregnancy and complicates about 5% of all pregnancies (Morton, 2016). Annually 40000-70000 maternal deaths worldwide occur due to severe pre-eclampsia and eclampsia (Frazer, Cooper & Nolte, 2010). Preeclampsia is the second most common cause of maternal mortality in the United States, accounting for 12%- 18% of all pregnancy related maternal deaths (Sarsam, Shamdem, & Wazan, 2008). In South Africa, pre-eclampsia is the primary cause of maternal death (Frazer *et al* 2010). Pre-eclampsia is worse in middle and low income countries due to lack of technological and therapeutic interventions (Division of Reproductive Health, 2001)

In Kenyatta national hospital, Kenya, the incidence of eclampsia among 14,730 deliveries over a two year period -1st January -1999-31st December 2000 was 10% (Division of Reproductive Health, 2001). In Central province, Kenya, eclampsia (complication of pre-eclampsia) accounted for 7 % of pregnant women (Maina & Gichogo, 2014)

In Moi Teaching and Referral Hospital eclampsia was the leading cause of maternal mortality (Unpublished Hospital Report, 2013). In western Kenya, health care providers reported Preeclampsia (eclampsia) as a frequent pregnancy related complication (Division of Reproductive Health, 2001)

Screening for Pre eclampsia can identify up to about 95% cases of at risk mothers (Poon & Nicolaides, 2014). Current strategies for risk assessment are based on the obstetric, medical history and clinical examination (Moura, Lopez, Muithi & Costa, 2012). Pre-eclampsia is screened for during antenatal visits through history taking to identify risk factors such as elevated blood pressure, proteins in urine, history of; pre-eclampsia in past pregnancies, diabetes, hypertension among others (Shamsi, Saleem & Nishter, 2013). Prevention of pre-eclampsia requires that all women are screened across the FANC schedules, to enable early diagnosis, leading to early referral and treatment for better pregnancy outcomes (Osungbade & Ige, 2011).

Maternal and fetal deaths associated with pre-eclampsia are due to substandard care (Milne, Redman, Walker, Baker, Bradley, Cooper, Fletcher, Jokinen, Murphy, Niesson –Piercy, Osgood, Robson, Shennan, Tuffenel, & Waugh , 2005). There is sub optimal care in terms of the set standards where patients are not well screened for preeclampsia due to lack of tests, inadequacy of current protocol implementation and knowledge among heath care workers. (Kidanto, Mongren, Massawe, Lindmark & Nystrom, 2009; Koki, 2012). The observed hospital incidence of pre- eclampsia indicate poor screening strategies for pre-eclampsia despite high attendance for antenatal care during the first ANC visit (Urassa, Carlstedt, Nymstom, Massawe, & Lindmark, 2006). One of the pitfalls may be due to insufficient adherence to the basic program in Antenatal Clinic (ANC) (*ibid*). The sub optimal screening for pre-

eclampsia can have serious consequences such as eclampsia, characterized by convulsion and organ dysfunction (Perez-cuevas, Fraser, Reyes, Reinharz, Daftari, Heinz, & Roberts, 2003).

Effective early screening of pregnant clients to identify those at risk and initiation of management is key (Division of Reproductive Health, 2001; Sarsam, *et al.,* 2008), so as to avert serious consequences to both the mother and baby (Uzan, Carbonnel, Piconne, Asmar, & Ayoubi, 2011). According to Wagner (2004) there are no single reliable, effective screening tests for pre-eclampsia and no well established measures for primary prevention. Therefore the combination of available tests, identification of pre-eclampsia clinical signs and symptoms lead to effective management of preeclampsia and thus better outcomes of pregnancy (Dutta, 2004). Early ANC screening for preeclampsia would lead to early detection of risk factors to facilitate optimal management of women at high risk (Uzan, *et al.,* 2011). Since hypertensive disorders are unlikely to be prevented, early diagnosis of preeclampsia by the skilled birth attendant is of great importance so that monitoring and treatment can be initiated to reduce the severity of the disease (Milne *et al.,* 2005).

The current antenatal care is insufficient as a prevention strategy for preeclampsia (Urassa *et al*., 2006). Pre-eclampsia screening in the antenatal clinics in Kenya, especially in public hospitals has not been fully undertaken due to lack of /inadequate equipment such as blood pressure machine (McLntoshi &Washington, 2010; Bell, 2010). According to Osungbade & Ige, (2011) inadequate information given to clients and their family on danger signs in pregnancy and where to seek for help in case of signs of severe pre-eclampsia and eclampsia has resulted to maternal and neonatal morbidity and mortality. In Kenya, there are currently missed opportunities for pre-

eclampsia screening during ANC which may be attributed to lack of policies in place and inadequate provider knowledge for pre-eclampsia screening during antenatal period (Koki Agarwal, 2012).

Severe pre-eclampsia is associated with high perinatal mortality and morbidity (Sarsam *et al.*, 2008). The policy makers to formulate comprehensive antenatal booklet/ checklist for all health care facilities to follow government policies, for even distribution of preeclampsia screening services across the ANC visits. The study also determined the factors affecting effective screening for preeclampsia and what could be done to improve the screening.

1.2 Problem Statement

Pre-eclampsia is a serious complication of pregnancy characterized by raised blood pressure and proteins in urine (Tavassoli, Ghasemi, Ghomian, Ghorbani, & Tavassol 2010). Pre-eclampsia accounts for 5% to 7% of all pregnancies and is associated with poor maternal and perinatal outcomes (Douglas, Chandra, Hofmey & Dowswell, 2012). Globally, Pre-eclampsia accounts for more than 50,000 maternal deaths each year and at least one woman dies every seven minutes from a complication of severe pre-eclampsia (Safe Motherhood, 2005). Preeclampsia is the second most common cause of maternal mortality in the United States, accounting for 12%- 18% of all pregnancy related maternal deaths (Sarsam, Shamdem, & Wazan, 2008). In low and middle income countries, eclampsia (complication of preeclampsia) is more common, estimated at 16 to 69 cases per10, 000 live births (Frias, 2003 in Duley *et al.*, 2010). In Nigeria maternal mortality exceed 1000 deaths per 100,000 live births and eclampsia accounts for 40% of these maternal deaths (Nyamtema, Urassa, &

Roosemale, 2011). Pre-eclampsia contributes up to 30 % of maternal death in Muhimbili National Hospital in Tanzania (Kidanto *et al.,* 2009). In Kenya, severe pre-eclampsia is the second most frequent direct cause of maternal death (16%) after post partum hemorrhage (22%). In one district hospital, women admitted with eclampsia all died! (Safe Motherhood, 2005). In Riley Mother and Baby Hospital, at the Moi Teaching and Referral Hospital, Eldoret, Preeclampsia was leading among the obstetric emergencies at two hundred and ninety two (292), followed by obstructed labour (251) and postpartum haemorrhage (121) respectively in 2013 (Hospital Annual un-published Report, 2013). Preeclampsia was the second most common obstetric emergency in Bungoma County Referral Hospital, (Bungoma Hospital Annual unpublished Report, 2012)

Pre-eclampsia is associated with complications such as placental abruption, intracranial hemorrhage, hepatic failure, acute renal failure and cardiovascular collapse in pregnant women, while in babies, pre-eclampsia may predispose to intrauterine growth restriction, intrauterine fetal demise, low birth weight or prematurity (Tavassoli, *et al.,* 2010).

This study therefore aimed at determining the availability of PE screening services and factors affecting effective screening, offered to pregnant women attending antenatal clinic in Bungoma County Referral Hospital (BCRH).

1.3 Justification

No woman should die in the process of reproduction (Lewis, 2008). The screening activities are regarded as the minimum measures for early detection of pre-eclampsia (Milne *et al.,* 2005). Assessment of pre-eclampsia through screening services

contributes to attainment of Millenium Development Goals (MDGs) Four and Five, (WHO, *et al.,* 2007; WHO, 2010) now being transformed in to Sustainable Development Goals (SDGs) 3.1 and 3.2. Prevention of complications of pre-eclampsia requires screening all women across the FANC schedules (*ibid*) Screening pregnant women antenatally predicts clients who are predisposed to preeclampsia so that early referral is done for better outcomes (Osungbade & Ige, 2011).

Improvement in pre-eclampsia screening services antenatally will be effective in capturing the incidence of pre-eclampsia and eclampsia and thus reducing the morbidity and mortality associated with pre-eclampsia (*ibid*). Screening for preeclampsia is effective in early detection of complications (Chelagat, Rotich, Ongeso, Wanyonyi, Kiilu, Mwanzia, Otsula, & were 2011).

The study highlights the preeclampsia screening services, their distribution and factors affecting the effective pre-eclampsia screening. The findings will inform development of health policy and financing (Kidanto *et al.*, 2009; Urassa *et al.*, 2006).There should be screening during routine antenatal care to identify woman's level of risk for preeclampsia based on factors in her history and other tests (Poon & Nicolaides, 2014).

Although some progress have been made in reduction of maternal mortality, but further improvement is needed (Say, *et al*, 2014)). It is major challenge in obstetrics to identify pregnancies at risk for pre-eclampsia since there is no available data on the performance of recommended screening strategy (Poon & Nicolaides, 2014). For reduction of maternal mortality, understanding the cause of death for effective policy and health programs is key (Say, *et al*, 2014). Therefore the findings will help in

improving quality in the care provided to antenatal clients hence the contributing to the hospital mission and vision in provision of quality health care.

1.4 Research questions

1. What are the available pre-eclampsia screening services for pregnant women attending antenatal clinic at Bungoma County Referral Hospital?
2. How is the distribution trend for pre-eclampsia screening services provided to expectant women across the recommended four FANC visits in Bungoma County Referral Hospital?
3. Which are the factors influencing provision of pre-eclampsia screening services in Bungoma County Referral Hospital

1.5 Objectives

1.5.1 Broad Objective

To assess the pre-eclampsia screening services offered to pregnant women attending antenatal clinic in Bungoma county Referral Hospital

1.5.2 Specific Objectives

1 To establish the pre-eclampsia screening services among women attending ANC in Bungoma County Referral Hospital

2 To determine the distribution for preeclampsia screening services offered to expectant mothers across the scheduled antenatal visits in Bungoma County Referral Hospital

3 To identify the factors influencing provision of pre-eclampsia screening services in Bungoma County Referral hospital

CHAPTER TWO

LITERATURE REVIEW

2.1 Definition of Preeclampsia

Pre-eclampsia is a condition occurring in pregnancy after 20 weeks gestation, characterized by hypertension and proteinuria (Fraser *et al.*, 2010). Eclampsia, which is a major complication of pre-eclampsia, occurs during pregnancy, delivery or postnatal period (Clinical Protocols and Guidelines, Maternity All Sites, 2010; Olds, Ludewig & Davidson, 2004). For many women who have mild pre-eclampsia the outcome is good but severe pre-eclampsia may lead to death or serious problems for the woman and/or her baby (Duley *et al.*, 2010).

The complications for severe pre-eclampsia are coagulopathy, liver disease and stroke while in neonates pre-eclampsia may lead to preterm delivery and intra uterine growth restriction (Morris, Riley, Doug, Deeks & Kilby, 2013; Duley *et al.*, 2010). Pre-eclampsia (eclampsia) presents in several ways such as proteinuria, raised blood pressure, end organ dysfunction, therefore health providers have to be vigilant when screening clients (Churchill, 2013). Since it is difficult to prevent preeclampsia, early diagnosis by the skilled birth attendants is important so that monitoring and treatment can be initiated early enough to reduce the severity of the disease (Fraser *et al.*, 2010). Accurate prediction of pre-eclampsia would enable early and optimal management .of pregnant women at risk (Uzan, *et al*, 2011). Pre-eclampsia screening is initiated when

a prenatal client goes for her first booking at the hospital where the following are done: history taking, physical examination, client's urinalysis and sharing of health message on danger signs (Duley, Shireen & Abalos, 2006) and blood pressure (Uzan *et al*, 2011). Urinalysis, blood pressure, antenatal history, physical examination and abdominal examination are the basis for screening for pre-eclampsia (Maternal Guidelines Development Group Therapeutic Committee, 2010). Health education on impending eclampsia should be included as essential component of care in the guidelines for each antenatal visit (Magonna, Requejo, Merialdi, Campbell, Cousens, & Filippi, 2011)

2.2 DESCRIPTION OF HEALTH PROMOTION MODEL BY PENDER NOLA

Health Promotion Model (HPM) has the following components:

(a) EXPERIENCE

Individual characteristics:

Personal factors: personal factors such as age, qualification and years skilled birth attendant has served in service may influence the way she or he carries out screening of pre-eclampsia.

Previous experience:

Previous experience of skilled birth attendant with clients suffering from PE may influence the effective screening for PE, since they do not want a repeat of the poor outcomes of pregnancy. The previous outcomes of clients with PE may facilitate skilled birth attendant to carry out proper screening.

(b) Behavior specific cognitive

Perceived benefits of effective pre-eclampsia screening:

Perceived benefits of effective screening may lead to early detection, monitoring and treatment of PE resulting in to a healthy baby and mother.

Perceived barriers:

Shortage of resources including, lack of BP machines and work overload, late initiation of antenatal visits by clients, lack of guidelines, lack of support supervision, may affect the screening process.

Perceived efficacy:

Health care workers with adequate knowledge on effective screening are likely to carry out services as required by the national guidelines on pre-eclampsia screening.

Situations that influence opinions/demands:

The availability of antenatal clients coming for services should enable the skilled birth attendant to carry our screening.

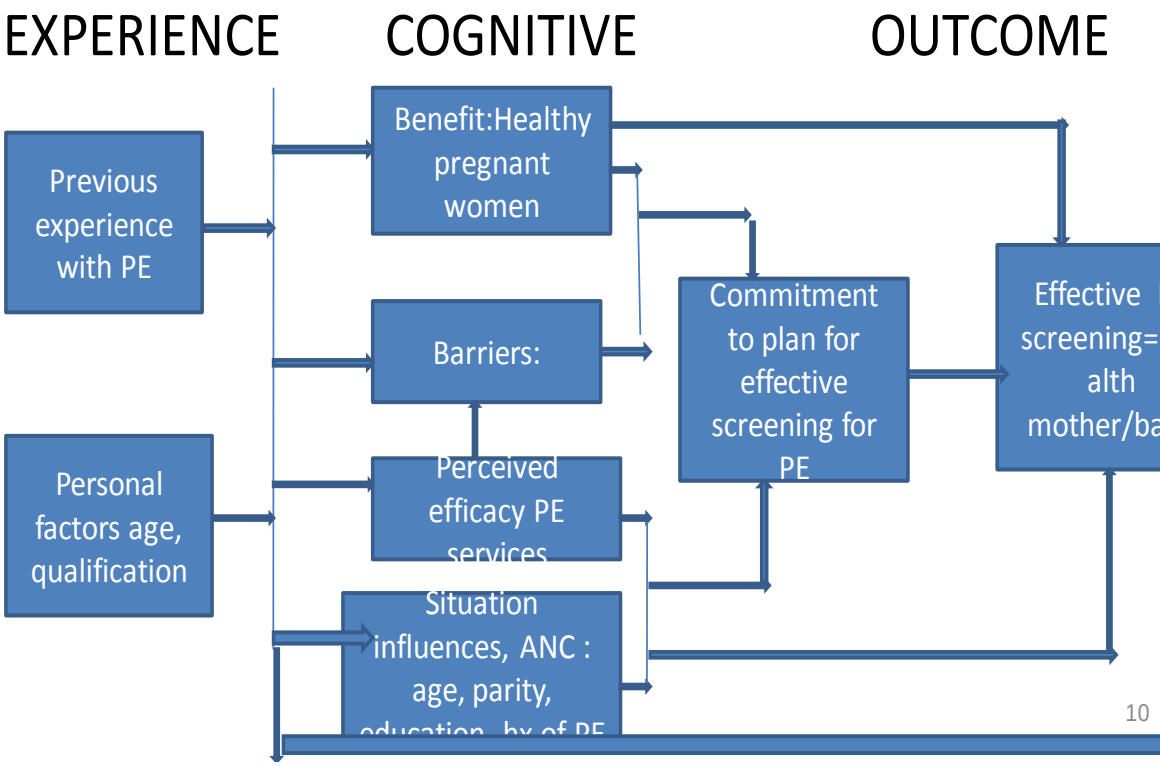
© OUTCOMES

Outcomes of effective pre-eclampsia screening:

The outcome of effectively screened client is a healthy mother and baby, without or with minimal and well managed complications of PE.

CONCEPTUAL FRAMEWORK: THE HEALTH PROMOTION MODEL BY PENDER NOLA

Conceptual Framework



Adopted from Polit & Beck (2008): Page 142

2.2 Diagnosis of pre-eclampsia

A clinical diagnosis of pre-eclampsia can be made when the following criteria are fulfilled: there is hypertension (defined as systolic blood pressure > 140 mmHg or diastolic blood pressure

> 90 mm Hg) arising after 20 weeks gestation, accompanied by proteinuria (defined as proteins > 300 mg in 24 hours or 1+ on the dipstick or a spot urine protein creatinine ratio of > 30 mg/mmol/L). In severe pre-eclampsia, the following may be present; renal insufficiency - oliguria, Liver disease – raised serum transaminases and/or severe epigastric /right upper quadrant pain. There is also the presence of neurological problems – convulsions (eclampsia); hyperreflexia with clonus; severe headaches, persistent visual disturbances and hematological disturbances – thrombocytopenia; disseminated intravascular coagulation (DIC) and haemolysis. The fetus will display intrauterine fetal growth restriction (IUGR). Oedema is not included in the diagnostic features of pre-eclampsia, occurring as commonly in normal pregnant women and those with pre- eclampsia. However the rapid development of generalized oedema may be a marker of clinical deterioration in women with pre-eclampsia (Clinical Protocols and Guidelines-All sites, 2010)

2.3 Antenatal care

2.3.1 Antenatal care services

Antenatal care entails the comprehensive services given to pregnant women during their pregnancy period by a skilled birth attendant (KDHS, 2008-9). All pregnant women are at risk of getting complications; therefore the aim of antenatal care is to achieve a good outcome for both the mother and baby (MOMS and MOPHS, 2010).

The antenatal care encompasses sharing information on individual birth plans, danger signs, complication preparedness, family planning , Elimination of Mother To Child Transmission (eMTCT), skilled delivery, nutrition, measurement of blood pressure, prevention of anaemia, testing for blood sugar and urine for proteinuria done at every visit. These components make up the foundation n for the Focused Antenatal Care, in which a minimum of four visits are recommended, (MOMS and MOPHS, 2010).

Focused antenatal care (FANC) requires that a pregnant woman with no complications makes at least four visits to the clinic during pregnancy (Magonna *et al*, 2001, WHO, 2005). While this strategy has improved in the recent years, it is generally recognized that the antenatal care services currently provided in many parts of the world fail to meet the recommended standards since the first consultation is normally late in pregnancy (WHO, 2005).

According to Stepp (2007) early detection of pre-eclampsia improves outcome of pregnancy, especially when a client begins the first visit early in pregnancy, the skilled birth attendant takes an in depth patient history that includes: demographic data, obstetric history, medical history of chronic illnesses and familial pre-eclampsia, the client is weighed, blood Pressure is obtained, palpated and urine is checked for proteinuria during each antenatal visit.

However, late enrollment for antenatal services is common in many African countries and may adversely influence the detection of early onset of pre-eclampsia (Urassa *et al.*, 2006). Pre-eclampsia occurs mostly in un-booked mothers (Onu & Aisien, 2004) while access to skilled care can reduce maternal and new born mortalities and improve pregnancy outcome (WHO, 2005)**.** Not having had any antenatal care is a

consistent risk factor for adverse outcome of preeclampsia regardless of where the woman lives (Duley & Henderson-Smart, 2009). Women who do not receive antenatal care are more likely to die from complications of pre-eclampsia (Lewis & Drife, 2001 in Fraser *et al.,* 2010) than woman who had received any level of prenatal care (Mackay, Berg & Atrash, 2001).

According to Baker (2006), antenatal care aims at prevention, promotion, detection and management of factors that adversely affect the health of a mother and the baby.

2.3.2 Schedules for Focused Antenatal Care (FANC) visits

According to MOMS & MOPHS (2010) the Kenya government recommends a minimum of four compressive personalized antenatal visits which should be spread out during the entire pregnancy period, each visit has specific events that are evidence based and tailored to individual client's need as follows: First visit < 16 weeks, Second visit – 16-28 weeks, Third visit- 28-32 weeks, Fourth visit- 32-40 weeks.

2.3.3 Uptake of Antenatal Care services

The Kenya guidelines recommend that the first antenatal visit should occur within the first trimester of pregnancy (KDHS, 2008-9), less than 16 weeks gestation (Magonna *et al.,* 2011). Antenatal care can be more effective in preventing adverse pregnancy outcomes when it is sought early in pregnancy since early detection of problems in pregnancy leads to more timely referrals and care (Chelagat, *et al.,* 2011). According to KDHS (2008-9), it is realized that only 47% of all women make four or more antenatal visits, only 15% of women obtain antenatal care in the first trimester of pregnancy. KDHS further says that more worrying is the declining number of women

who seek antenatal care having dropped from 52% in 2003 to 47% in 2008-9 since most women make their first visit when the pregnancy is about six months. Multiparous women often seek skilled care when they experience complications while rural women are less likely than their urban counterparts to get antenatal care (KDHS, 2008-9; Magonna, *et al.*, 2011). KDHS (2008-9) further calls for interventions to make pregnant women attend first prenatal visit in the first trimester. To achieve the full life-saving potential of ANC, at least four visits and a package of proven high-impact interventions (WHO, 2014)

2.4 Pre-eclampsia Screening services

Strategies for risk assessment for preeclampsia are based on obstetric and medical history and clinical examination in pregnancy (Osungbade & Ige, 2011; Poon & Nicolaides, 2014). Since it is difficult to prevent preeclampsia, early diagnosis by the skilled birth attendant is important so that monitoring and treatment can be initiated early enough to reduce the severity of the preeclampsia (Fraser *et al.*, 2010). Preeclampsia screening assessment is initiated when a prenatal client goes for her first booking at the hospital, based on history taking, physical examination, Laboratory examination of the client's urine and sharing of health message on danger signs (Duley, Shireen & Abalos, 2006, Maternal Guidelines Development Group Therapeutic Committee, 2010). Pre-eclampsia presents in several ways, therefore skilled birth attendants have to be vigilant when screening clients and those found with complications are referred for further assessment and treatment (Churchill, 2013). Admission and surveillance is done for both mild and severe pre-eclampsia and management depends on severity of the disease (Fraser et al, 2010). Factors that

are likely to affect pre-eclampsia screening include: education standard, marital status and people's way of living (Osungbade & Ige, 2011). Among other factors that impede effective screening for pre-eclampsia is lack/ or inadequate equipment (McLntosh and Washington, 2010).

2.5 Risk factors for pre-eclampsia

The midwife is in a unique position to identify clients who are at risk of preeclampsia by taking a comprehensive history at the first meeting to elicit risk factors (Fraser *et al.*, 2010). Risk factors include history of previous pre-eclampsia, preexisting medical conditions, multiple pregnancy, family history, high blood pressure, high body mass index, and maternal age-below 20 years and above 40 years, and nulliparity **(**Simon, Carlle, Perrotin & Giravdeau, 2013, Osungbade & Ige, 2011). All pregnant women need skilled care including being screened for potential risks for pre-eclampsia (WHO, 2005).

According to MOMS/MOPHS (2010), preeclampsia screening among pregnant women should include demographic data, potential risk factors in obstetric history; occurrence of hypertension or preeclampsia during previous pregnancies. Given that effective measures and screening tools are presently inadequate, routine nursing assessment of the signs and symptoms indicative of pre-eclampsia –eclampsia remain critical to the detection, monitoring and effective management of the pre-eclampsia (Bell, 2010)

2.5.1 Social demographic

2.5.1.1 Age

Pre-eclampsia occurs most frequently in women at the extreme reproductive age brackets: young women less than 20 years who are primigravidae and older women (>35-40 years) have a markedly increased risk (MOPHS & MOMS, 2010). According to Tebeu, Foumane, Mbu, Fosso, Biyaga, & Fomulu, (2011) there is increased risk for pre-eclampsia among pregnant women who are at a younger age; Ages below 20 years carry high risk, adolescents and teenagers, pregnant women who are at ages above 35 years carry a major risk for pre-eclampsia. In a study in Kenyatta National Hospital and Pumwani Maternity Hospital, Pre-eclampsia was common in young primegravida of mean age of 24.6 years (Gesami, 2013)

2.5.1.2 Education

According to KDHS (2008-9) women's education is associated with antenatal care coverage, where women with higher education are much more likely to have received care from a medical doctor than those with no education, while the proportion of women who get no antenatal care declines steadily as education increases

Illiteracy is associated with about two fold risks for developing pre-eclampsia in pregnancy, lack of education leads to preconscious marriage and to limited access to health care (Tebeu *et al.,* 2011). With no education, the urgency to seek for health care even during complication is an afterthought while high level of education cushions pre-eclampsia (Kashanian *et al.,* 2011)

2.5.1.3 Employment

According to Tebeu *et al.,* (2011) housewives are at increased risk for developing pre-eclampsia and so is employment. Working women have 2.3 times the risk of developing preeclampsia compared with non working women. Low-stress situation is cushion for pre-eclampsia (Shamsi *et al.,* 2013). Shamsi (2013) further stipulates that stressful work and home environment are also associated with preeclampsia.

2.5.2 Obstetric history

2.5.2.1 Parity

Nulliparous and grand Multiparous carry an increased risk for pre-eclampsia (Tebeu *et al.,* 2011, Osungbade & Ige, 2011).The nulliparous woman has two fold risks for pre-eclampsia compared to multiparous (Kashanian *et al.*, 2011)

2.5.2.2 History of preeclampsia in previous pregnancy/family history

According to MOMS &MOPHS (2010) Previous pre-eclampsia is associated with higher rates of severe and early onset pre-eclampsia. History of preeclampsia in previous pregnany is associated with adverse perinatal outcomes associated with preterm delivery in the current pregnancy (Milne *et al.*, 2005). Family history of pre-eclampsia increases a woman's risk of developing pre-eclampsia herself (Pre-eclampsia Foundation, 2006)

2.5.2.3 Time interval between pregnancies

A long inter pregnancy interval is associated with a higher risk of pre-eclampsia in women with no previous pre-eclampsia (Basso, Christesen & Oslen, 2001). More than

ten years since the last delivery is a significant risk factor for pre-eclampsia (MOMS & MOPHS, 2010; Duckitt & Harrington, 2005).

2.5.2.4 History of twins

Multiple pregnancies triple the risk for pre-eclampsia and more so triplet pregnancy **(**Duckitt & Harrington, 2005; Suzuki & Igarashi, 2009)

2.5.3 Chronic disease/ pre-eclampsia

Underlying medical condition such as diabetes, chronic hypertension and renal disease contribute to the development of pre-eclampsia (Duley *et al.*, 2006; MOMS &MOPHS, 2010). Genetics play a role in the pathogenesis of pre-eclampsia and that women with a first degree relative who has had pre-eclampsia are more likely to develop the disease, while men who were born from a pree-clamptic pregnancy are more likely to be fathers in a pre-eclamptic pregnancy (Tumer, 2010). According to the National Guidelines for Quality Obstetrics and Perinatal Care, Kenya (2010) 20-40% of daughters and 11-37% of sisters of pre-eclamptic women also develop the condition while twin studies have shown a high correlation approaching 40%. According to Luealon & Phupong (2010), chronic illnesses that run in the family have significant role in a woman developing pre-eclampsia. Luealon & Phupong further say that history of gestational diabetes, pre-gestational diabetes mellitus, family history of hypertension and perceived stress have an impact on pre-eclampsia. Family history of hypertension is an important risk factor for pre-eclampsia (Kirsten & Harrington, 2005; Shamsi *et al.*, 2013). Shamsi, *et al*., (2013) adds that in a primegravida, a family history of pre-eclampsia is associated with a fourfold increased risk of severe pre-eclampsia and recommends that this group warrant close

clinical surveillance during pregnancy. Genetic factors are important in the development of preeclampsia as well as gestational hypertension and that is why emphasis should be put to elicit previous history of pre-eclampsia (Shamsi, *et al*., 2013)

2.5.4 Partner-related risk factors

Partner change is associated with an increased risk of pre-eclampsia in women with no history of pre-eclampsia (Basso, *et al.*, 2001; Hawfied & Freedman, 2012). Pre-eclampsia may be a problem of prim paternity. This could explain why women are more at risk of pre-eclampsia in their first pregnancy and why parous women who later conceive by a new partner also have an increased susceptibility to the syndrome. Many studies confirm that change of partner raises the risk for pre-eclampsia in subsequent pregnancies. Women with more than three children who is changing a partner should be approached as being primegravida. The inter-pregnancy interval, which is strongly associated with change of partner, may confound or modify the paternal effect on pre-eclampsia (Shamsi *et al.*, 2013)

2.5.6 Smoking

Perinatal outcomes are significantly worsened among preeclampsia who smoked and the harmful consequences of smoking on pregnancy outcome far outweigh risk reduction. (Shamsi *et al.*, 2013)

2.6 Physical examination

2.6.1 Blood pressure monitoring

Measurement that exceed 140 mmhg systolic or more than 90mmhg diastolic is mostly used as criteria to consider hypertension (Bell, 2010). According to Fraser *et al.,* (2010) blood pressure should not be taken immediately after a woman has had anxiety, pain and exercise, 10minutes rest should be given before measuring the blood pressure, avoid supine position due to the effect of gravid uterus on the venous return, the sitting up or left lateral positions is used, the appropriate size of the cuff should be emphasized and accurate recording of the blood pressure should be done. Blood pressure should be measured at each prenatal visit (Wagner, 2004)

2.6.2 Abdominal examination

Fundal height should be measured at each prenatal visit because size less than dates may indicate intrauterine growth retardation or oligohydriomnios due to pre-eclampsia. The intrauterine growth retardation may become apparent long before diagnostic criteria for preeclampsia are met (Wagner, 2004). Intrauterine growth restriction is considered major complication of pre-eclampsia (Maternal Guideline Developmental Group Therapeutics Committee, 2010).

2.6.3 Oedema

Increasing maternal facial edema and rapid weight gain also should be noted because fluid retention often is associated with pre-eclampsia. Although facial edema, rapid weight gains are not unique to pre-eclampsia, it is wise to follow affected patients for

hypertension and proteinuria. Edema involving the lower extremities frequently occurs during normal pregnancy and therefore is of less concern (Wagner, 2004).

2.6.4 Weight monitoring

Body Mass Index (BMI) is helpful in detecting women at risk for developing pre-eclampsia since it is normally high in early pregnancy (Fraser *et al.*, 2010). The initial BMI is considered a more useful predictor of hypertension in pregnancy (Fraser *et al.*, 2010). BMI and rate of weight gain are great risk factors that amplify the burden of pre-eclampsia among women. According to Mbah, Kornosky, Kristnsens, August, ALio, Marty, Belogolovkin, Bruder & Salihu (2010) the rate of pre-eclampsia increased with increasing BMI with super obese women having the highest incidence, compared with normal weight women and obese women. Weight gain may be useful in conjunction with other parameters in screening of pre-eclampsia (Fraser *et al.*, 2010).

Body mass index (BMI) / obesity of more than 35 at booking is a risk factor for pre-eclampsia. (Shamsi *et al.*, 2013; Luealon & Phupong, 2010)

2.7 Danger signs for Pre-eclampsia

All pregnant women should be informed about preeclampsia danger signs in pregnancy (KDHS, 2003). Furthermore, KDHS, (2008-9) reveals that women with high education and nulliparity are more likely to be informed of danger signs. Danger signs during pregnancy include severe abdominal pains, generalized body swelling, convulsions, loss of consciousness and headache (MOMS &MOPHS, 2008). Education of pregnant women on danger signs is among the aims of antenatal care

(Baker, 2006). Therefore pregnant women should routinely receive information on signs of preeclampsia complications (KDHS, 2008-9). Wagner (2004) adds that after 20 weeks of gestation, all pregnant women should be asked about the danger signs, which if possible should be on a standardized form. Pre-eclampsia can degenerate in to a life threatening situation in average of two weeks from diagnosis and can develop between antenatal assessments (Milne *et al*., 2005). At above 20 weeks, specific signs and symptoms like visual disturbances, persistent headache and epigastric pain (Wagner *et al.,* 2004) and seizures (Fatemeh, Marziyeh, Anahita & Samira, 2010) should be asked from the pregnant woman. Women have to be educated about the danger signs in pregnancy (Fraser *et al.,* 2010) which is the emphasis of the Focused Antenatal Care (FANC). Inadequate information to clients and their family on preeclampsia danger signs and where to seek for help in case of complication has resulted to complications during pregnancy (Osungbade & Ige, 2011). Health education on preeclampsia danger signs should be included as essential component of care in the guidelines for each visit. (Magonna *et al.,* 2011)

2.8 Urinalysis

Baseline investigations should be performed early in pregnancy for all women, including urine for proteins (Wagner *et al.,* 2004; Osungbade & Ige, 2011).Testing for proteinuria makes significant contribution to the assessment of preeclampsia particularly where presentation is atypical more so where hypertension is not present (Fraser *et al.,* 2010)**.** One of the cornerstones of antenatal care includes screening program aimed at detection of pre-eclampsia through urinalysis for proteins. A quick

method of checking for Proteinuria is by using reagent strips; the method is quick, portable and easy to perform (Morris, Doug, Deeks, & Kilby, 2013)

Proteinuria is a defining dysfunction of pre-eclampsia. Quantitation of a timed collection has been the gold standard for many decades and is expressed as the amount of protein excreted in the urine per unit time (Morris *et al.,* 2013; Homfeyr & Belfort, 2009). The severity of the proteins in pre-eclampsia is seen as a predictor of adverse outcomes for the mother. Therefore proteinuria has been proposed and studied as both an indicator of severity in pre-eclampsia as well as the predictor of outcome and hence decisions are made based on the degree of Proteinuria (Homfeyr & Belfort, 2009)

Proteinuria is the urinary excretion of > or equal to 0.3grams of proteins in 24 hour specimen that correlate with a random of > or equal to 1 urine dipstick in the absence of urinary tract infection (Bell, 2010).The level of proteins indicate the degree of vascular damage, reduced kidney perfusion, reduced creatinine clearance and increased creatinine and uric acid (Fraser *et al.,* 2010). Proteinuria of 5g or more per 24 hour is one of the diagnostic criteria for severe pre-eclampsia. In addition to worsening maternal and fetal conditions, and gestational age, complimented by hematologic and biochemical parameters should for the time being remain the primary determinants for timing delivery in women with pre-eclampsia (Homfeyr & Belfort, 2009; Tumer, 2010; KDHS, 2008-9).

2.9 Blood Count

Complete blood count is helpful where the major signs of preeclampsia are absent; Proteinuria and hypertension. (Fraser *et al*, 2010). According to KDHS, (2003), only

53% of the antenatal clients have their blood samples taken for haemoglobin level estimation

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CHAPTER THREE

METHODOLOGY

3.1 Introduction

The chapter comprises of the study design, research setting, study population, sampling process, Plans for analysis and ethical considerations.

3.2 Study Setting

This study was conducted in Bungoma County Referral Hospital, western region of Kenya. It is the county referral hospital for Bungoma County. It has a bed capacity of 217 although it has a bed occupancy rate of 130%. It has a catchment population of 1.2 million people, mainly from the western part of Kenya. The hospital receives patients within the county and the periphery sub-counties of the neighboring counties like Busia and Kakamega. Coverage for antenatal attendance on first visit is over 80 percent and declines in subsequent visits.

3.3 Study Design

This was a Cross sectional descriptive study involving a mixed method approach using both quantitative and qualitative techniques. Cross sectional survey designs are used in exploratory studies to allow researchers to gather information, summarize, present and interpret for the purpose of clarification (Orodho, 2002). This type of research design depicts the state of affairs as it exists at the time of the study. It essentially describes, records, analyses and interprets conditions as they exist.

3.4 Study population

The study population comprised of all pregnant women attending ANC services and the midwives working at the MCH in Bungoma County Referral Hospital. The target population for this study consisted of antenatal women and midwives in the MCH department. Clients on their first visit and those on subsequent visit; regarded as the second, third or fourth visits were sampled. All the midwives (twelve) in the MCH department were included in the study. There were 3497 expectant women who made first visit, 2765 and 1747 and 1151 for second, third and fourth visits respectively in the year 2013 (BCR Hospital records, 2013; unpublished report).

3.5 Sample size determination

The sample size was derived using Fisher *et al.,* 1998 formulae with a 95% confidence interval and sampling error 5%.

$$n = \frac{Z^2 \, pq}{d^2}$$

Where;

n = the sample size

Z = the standard normal deviate at the require confidence level was 95% -1.96

p= proportion of expectant mothers being effectively screened for PE antenatally was 0.5

q=1-p

d=the level of statistical significance set at 0.05

Substituting;

$$n = \frac{(1.96)^2(0.5)\,(0.5)}{(0.05)^2}$$

n=384

Since the target population is less than 10,000 (763) the sample size is adjusted using the formula

$$n' = \frac{n}{1+\frac{n}{N}}$$

Where,

n is the sample size based on the calculations above, and *N* is estimated population size.

$$n' = \frac{384}{1+\frac{384}{763}} = 255.44$$

n=256

The final sample was inflated by 10% to account for non-responses hence 282 mothers were required for the study.

Stratified proportionate sampling was used to get the sample size in each stratum (visit)

As shown below:

Table 1:a sampling for each stratum

ANC Visit (strata)	Population (per 2013)	Sample
First visit	291	$\frac{291 \times 282}{763} = 108$
Second visit	230	$\frac{230 \times 282}{763} = 85$
Third visit	146	$\frac{146 \times 282}{763} = 54$
Fourth visit	96	$\frac{96 \times 282}{763} = 35$
Total	763	282

3.6 Eligibility Criteria

3.6.1 Inclusion criteria for antenatal clients

To participate in the study the client should:

i. Have a confirmed pregnancy.

ii. Be willing to participate in the study by giving an informed consent

iii. Should have valid and duly filled ANC booklet

iv. Should be of a sound mind.

3.6.2 Exclusion criteria for antenatal clients

i. Expectant women coming for more than the four recommended ANC visit

ii. Expectant clients too sick to participate in the study

iii. Those who decline to give consent

3.6.3 Inclusion criteria for midwives

i. The midwives should be currently working in the MCH/FP department.

ii. The midwives should be willing to participate in the study by consenting

3.6.4 Exclusion criteria for midwives

i. Skilled birth attendant on internship.

3.7 Sampling method

Stratified random sampling proportionate was used. The participants were categorized in to strata based on their clinic visits. The antenatal clients' were classified in to either first, second, third and forth antenatal visits. Thereafter, antenatal clients in each stratum were picked using simple random sampling method; all those picked randomly formed the sample size for each stratum. The sampling method gives every subject an equal chance of being included in the study and it has no bias. It is the best suited method for the antenatal clients as it provides for categorization of participants according to ANC scheduled visits. The number from the first visit kept on reducing respectively. The hospital has twelve midwives in the MCH/FP department and therefore census was conducted among all the midwives working in the MCH/FP department.

3.8 Data collection instruments

3.8.1 Questionnaire and checklist

The study utilized a semi-structured researcher administered questionnaire (Appendix 1V B) and checklist (Appendix 1V A). Data on PE screening services was collected from the mother and child booklets by the use of checklist. The semi structured interviewer administered questionnaire was used to collect data on PE screening from the skilled birth attendant.

The main variables that were included in the questionnaire were;

The visit number: refers to the visit number that the pregnant woman had come for during the encounter of this study. Refers to either, first, second, third or fourth visit

Demographic data: documentation of the following in the client's booklet; age, marital status, education, source of income

Obstetrics history: documentation of parity, gravidity, G.B.D, L.M.P, E.D.D, birth order, history of PE in the previous pregnancies

Family history: documentation of the following in the client's booklet: presence or absence of hypertension, diabetes and renal diseases in the family

Physical examination: Documentation of BP, weight, palpation findings

Laboratory services: documentation of urinalysis test, H.B

Danger signs: documented records showing that the client has been educated on danger signs in the client booklet

3.9 Validity and reliability

3.9.1 Instrument validity

The validity was checked by the experts in the area of study (Supervisors) to ensure that the instrument was well constructed, any ambiguous questions removed and sequence of questions co-ordinated and any irrelevant questions removed so that the instruments could serve the purpose for which they were intended for.

3.9.2 Instrument reliability

Reliability is the measure of the degree to which a research instrument yields consistent results after repeated trials (Mugenda & Mugenda, 2003). Pilot study was also used to check the instrument reliability.

3.9.4 Pilot study

The pilot study was carried out at the Bungoma County Referral Hospital, two weeks prior to commencement of the study. The clients who were interviewed during the pilot study were excluded from the major study. This was done to ensure that the instruments are appropriately designed. The instruments were administered to 26 mothers (10% of sample size). The split half technique was employed where questions were split into two (Odd and even). The Pearson product moment correlation coefficient of 0.63 was obtained and this was considered reliable.

3.9.3 Data collection procedure

After obtaining approval for the study from Institutional Research and Ethics Committee (IREC), Moi University and permission from Bungoma County Hospital administration, data collection began. Collection of data was spearheaded by the

researcher, being assisted by the research assistants, who were identified and trained. Data was extracted from the identified clients' antenatal booklets and keyed into the checklists. Semi-structured questionnaire were administered to the skilled birth attendant, after which the completed tools were collected back by the research assistants.

3.9.5 Data management, analysis and presentations

Questionnaires were checked for completeness, coded and entry done in a computer Microsoft access database. It was later exported to SPSS V.20 for analysis. Descriptive statistics (frequencies, means and standard deviation) were used to summarize the data. Presentation of data is in terms of graphs and tables.

3.10 Ethical consideration

Approval was sought from IREC before the commencement of study. Permission was obtained from Bungoma County Referral Hospital Management to conduct the study. Informed consent was obtained from the sampled participants before they were enrolled into the study. Patients' rights' was maintained by asking for their consent after explaining the study to them. Confidentiality was strictly maintained by consenting in private rooms, omitting client's name on the questionnaire, limiting access to identifiable data and pass word was used to deny access to un authorized persons. Findings of this study will be made available to the management of Bungoma County Referral Hospital to inform practice and policy. Microsoft Access database was pass-worded to limit access only to authorized persons and a copy kept on different location for back up.

CHAPTER FOUR

4.0 RESULTS

4.1 Socio-demographic characteristics

Majority (34.37%) of the respondents attending antenatal clinic were aged between 21-25 years; followed by those aged 26-30 years (26.1 %), those below 20 years and between 31-35 years were 24.29% and 10.08% respectively. The least represented age group was above 41 years at 1.55%.

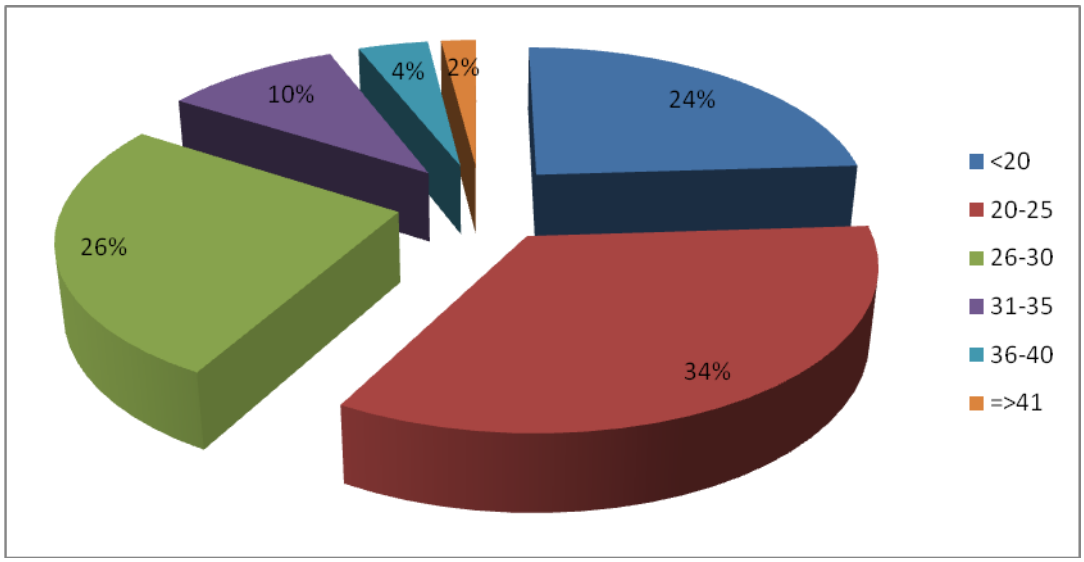

Figure 1: Participant Distribution by age-group

Majority of the participants (97.21%) had a minimum of primary school education with only 2.79% not attending any formal educational institution.

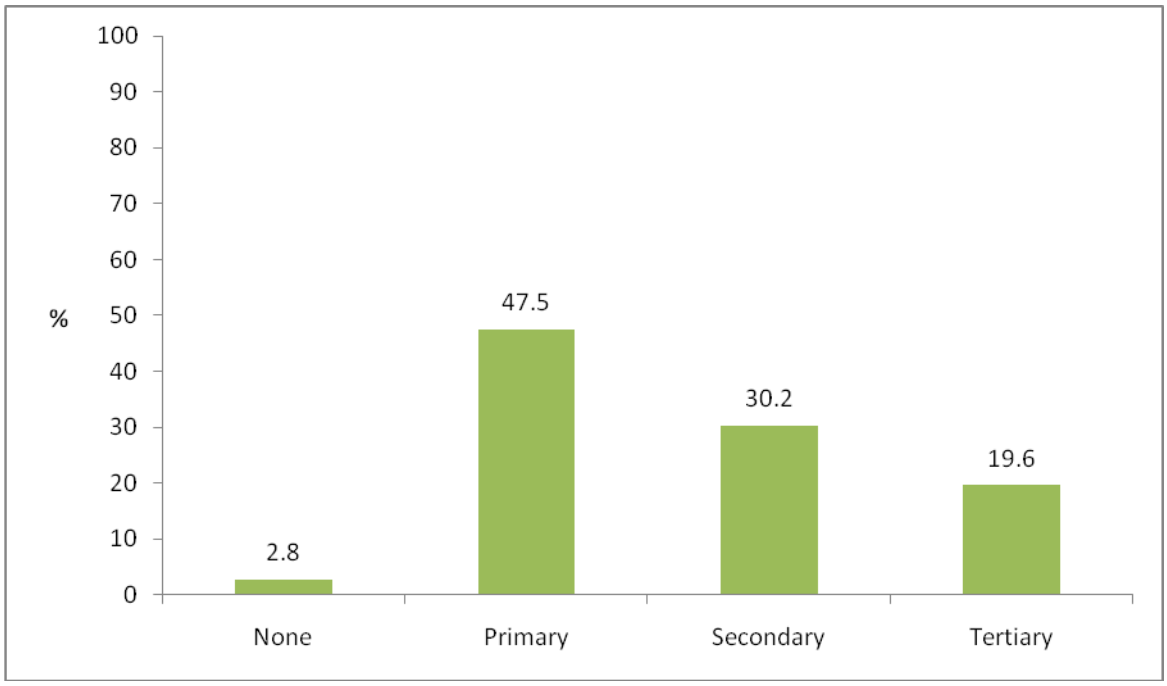

Figure 2: Level of Education

Over 90% of the participants were married (Figure 3) while only 56.4 % had a source of income as informal (Figure 4).

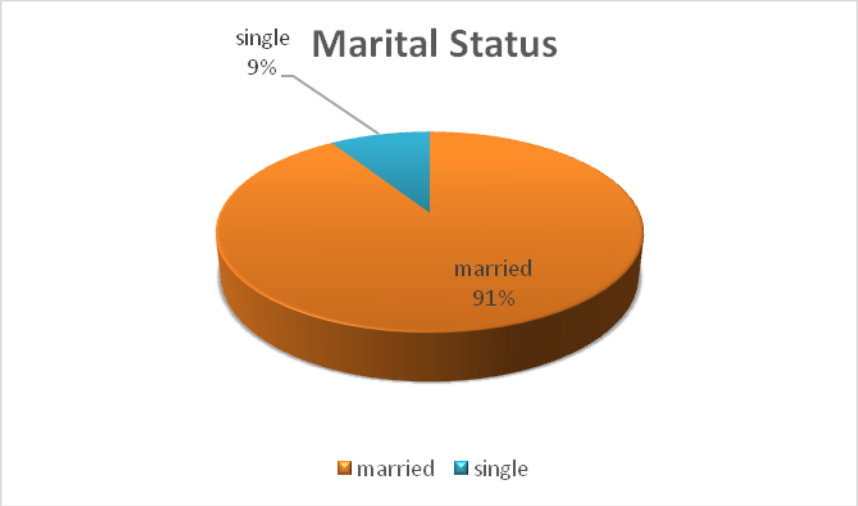

Figure 3: Marital Status

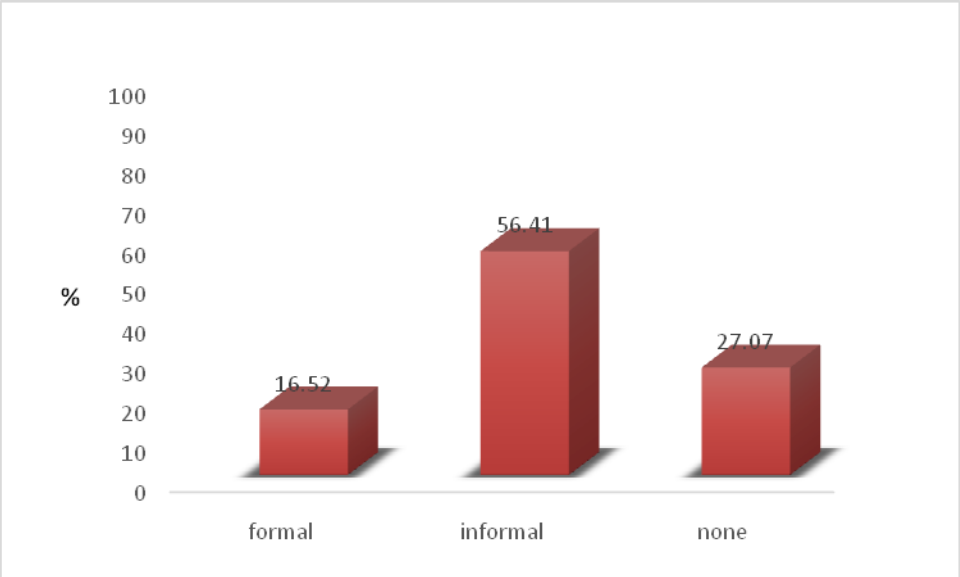

Figure 4: Source of income

Pre-eclampsia Screening Services offered to pregnant women

The pre-eclampsia screening services offered included obstetric history, history of twins, chronic medical illness and smoking. Other screening services included blood pressure monitoring, urinalysis and hemoglobin tests and abdominal palpations (Figure 5).

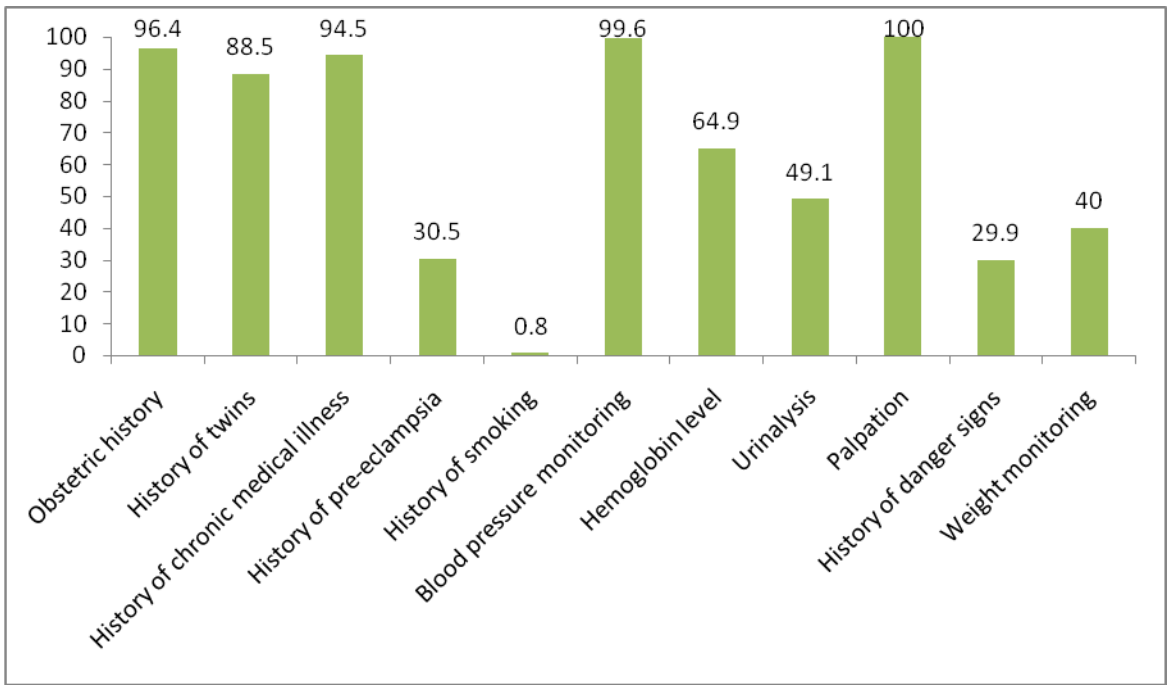

Figure 5: Pre-eclampsia Screening Services

Majority of the multiparous participants were aged between 26-30 years (12.6%) while majority of the nulliparous women were aged between 21-25 years (24.81%). Primegravida under 20 years were (23.77%). There was only one nulliparous participant (0.26%) above 40 years as shown in table 1.

Table 2: Maternal age versus parity

(Maternal age)	Frequency (Percentage)		Total
	Multiparous	Nulliparous	
<20years	2(0.52%)	92(23.77%)	94(24.29%)
21 - 25 years	37 (9.56%)	96 (24.81%)	133 (34.37%)
26 - 30 years	49 (12.66%)	52 (13.44%)	101 (26.10%)
31 - 35 years	32 (8.27%)	7 (1.81%)	39(10.08%)
36 - 40 years	11 (2.84%)	3(0.78%)	14(3.62%)
> 41 years	5(1.29%)	1(0.26%)	6(1.55%)
Total	136(35.14%)	251(64.86%)	387(100.00%)

$\chi 2=106.600$, $p<0.001$

the distribution of ANC visits among the participants decreased steadily from the first to the fourth visit (Figure 6). Screening services for preeclampsia were also majorly concentrated during the first antenatal visit (Figures 6-11).

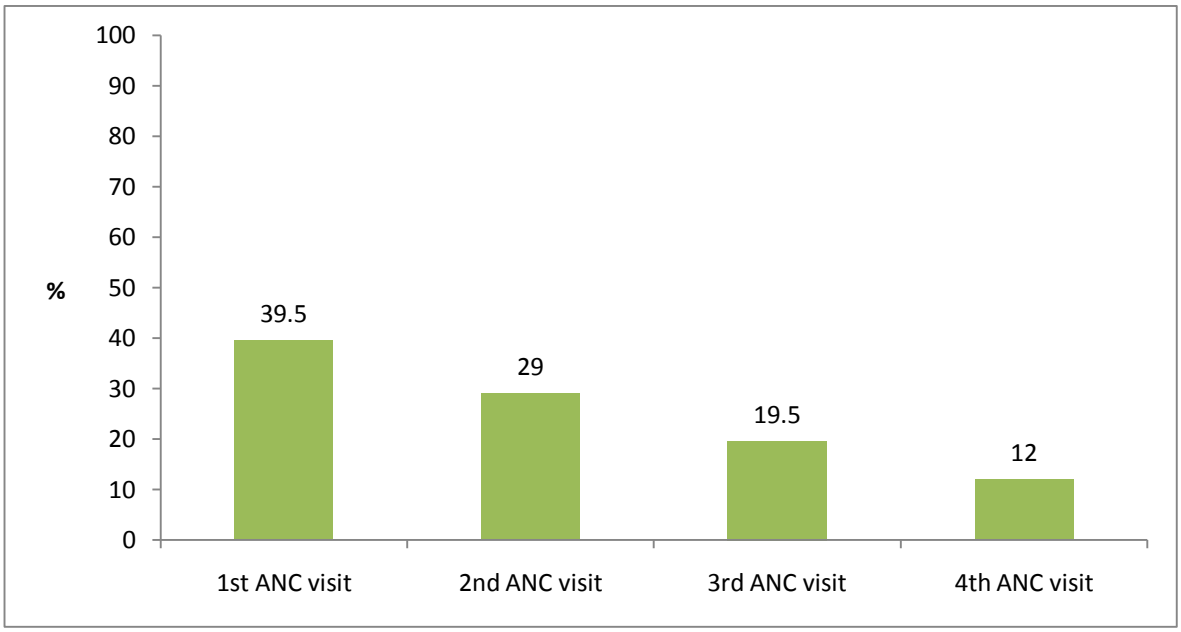

Figure 6: Distribution of ANC visits

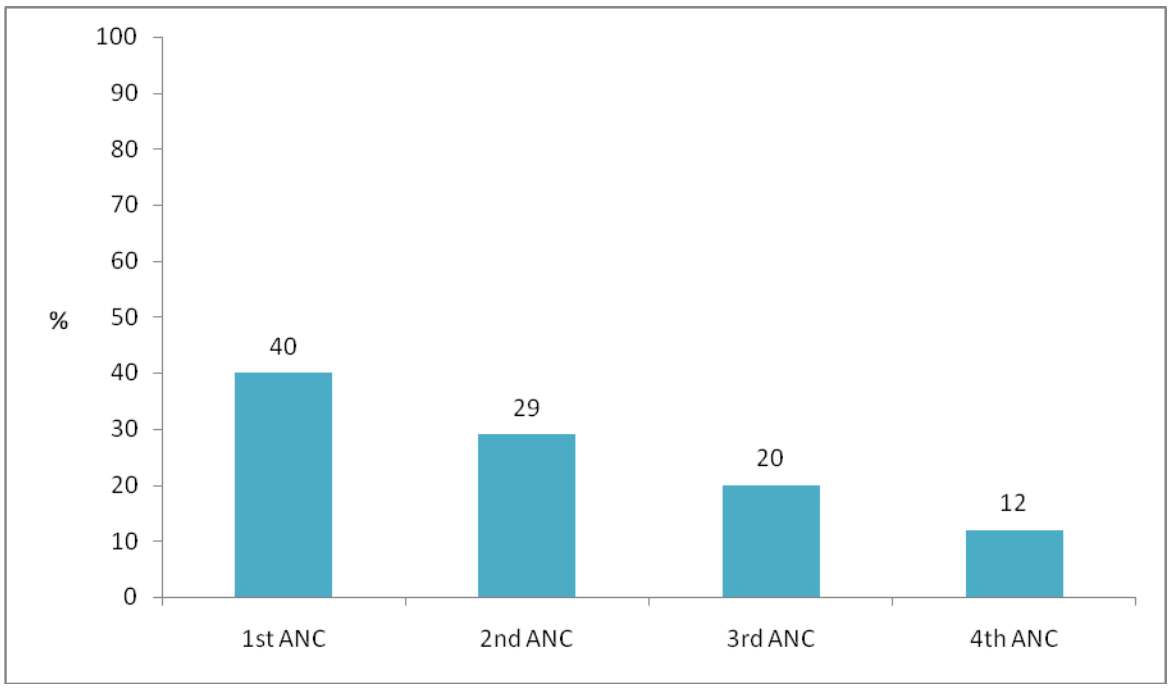

Figure 7: Distribution of weight monitoring across clinic visits

Screening for obstetric history decreased with the decreasing number of clients from the first through the fourth visit respectively

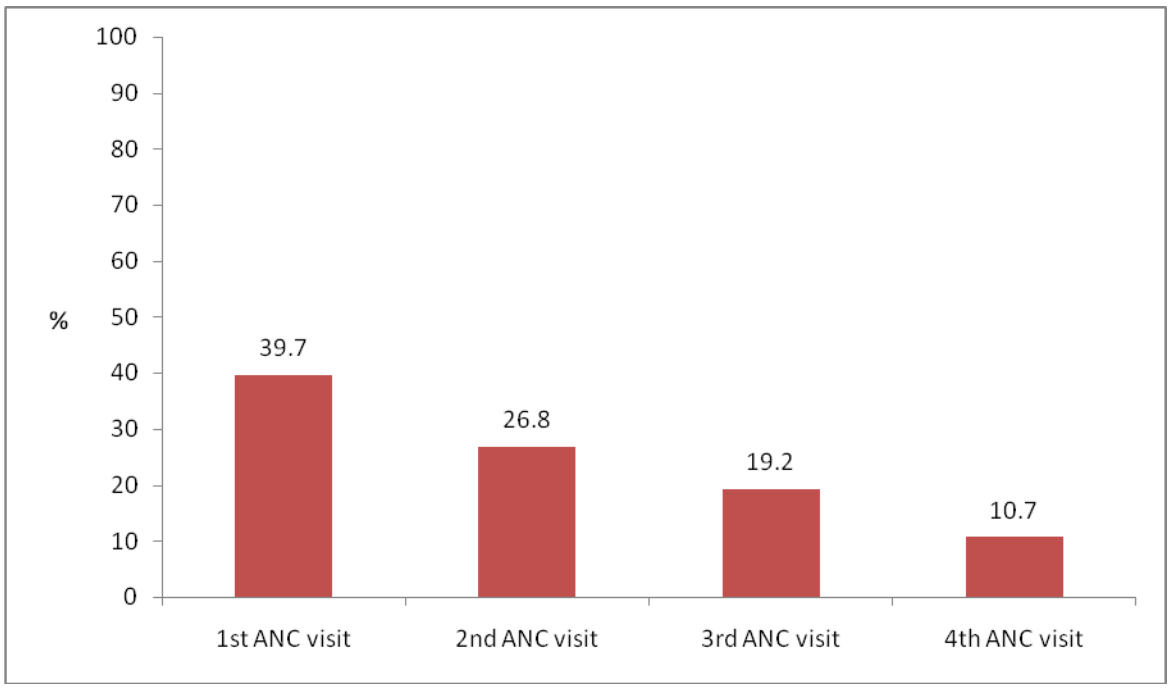

Figure 8: Distribution of screening for obstetric history

Distribution for screening for history of twins was high during the first ANC visit but then reduced respectively through the subsequent

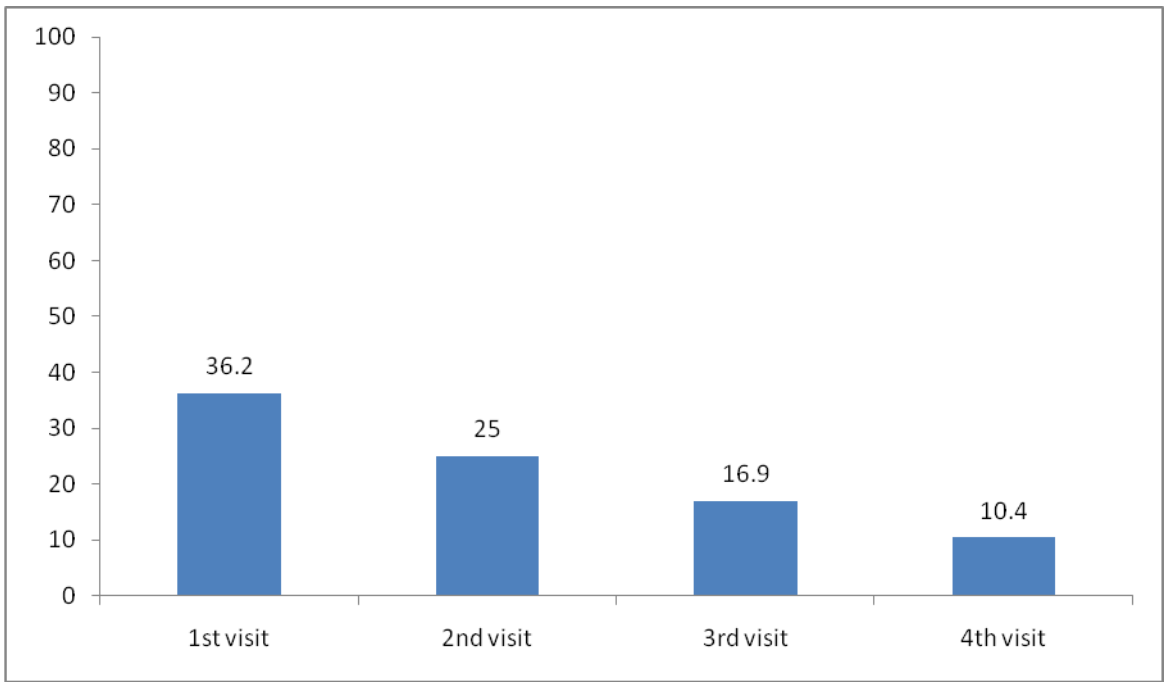

Fig 9: Distribution of screening for history of twins

Majority of the clients were not screened for smoking

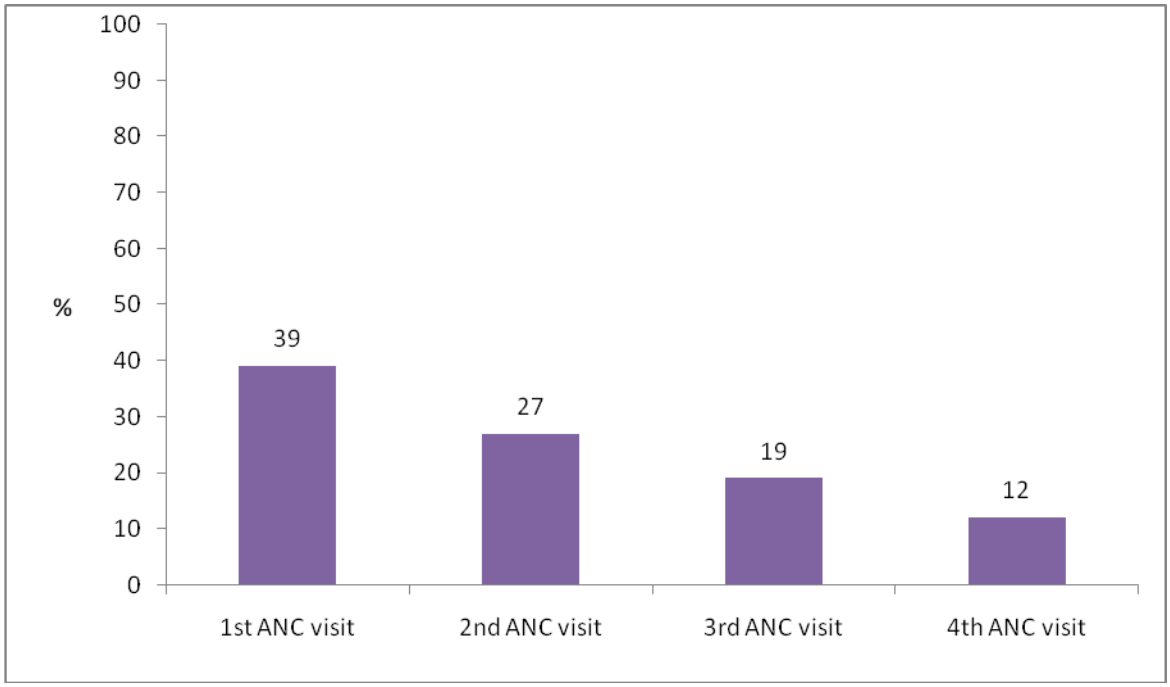

Figure 10: Distribution of smoking history screening (Not screened)

Majority of the clients were done weight monitoring during the first visit

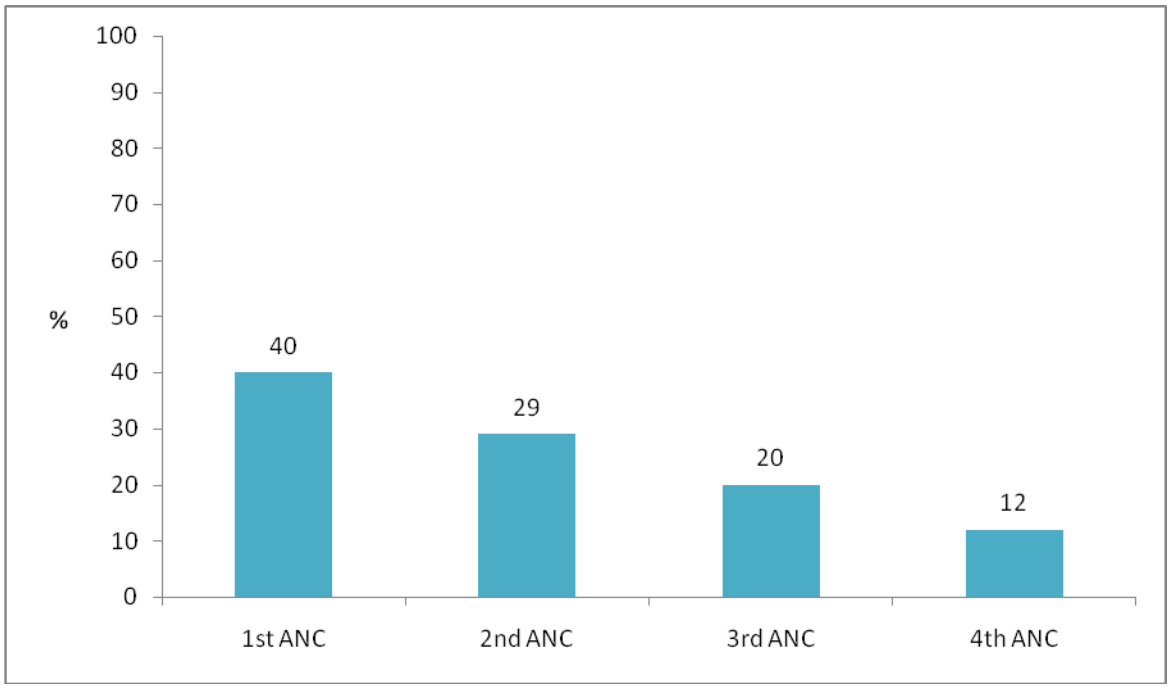

Figure 11: Distribution of weight monitoring across clinic visits

Majority of the clients were screened for haemoglobin level during the first ANC visit. The screened dropped during the second visit but was again intensified during the 3rd and 4th visit

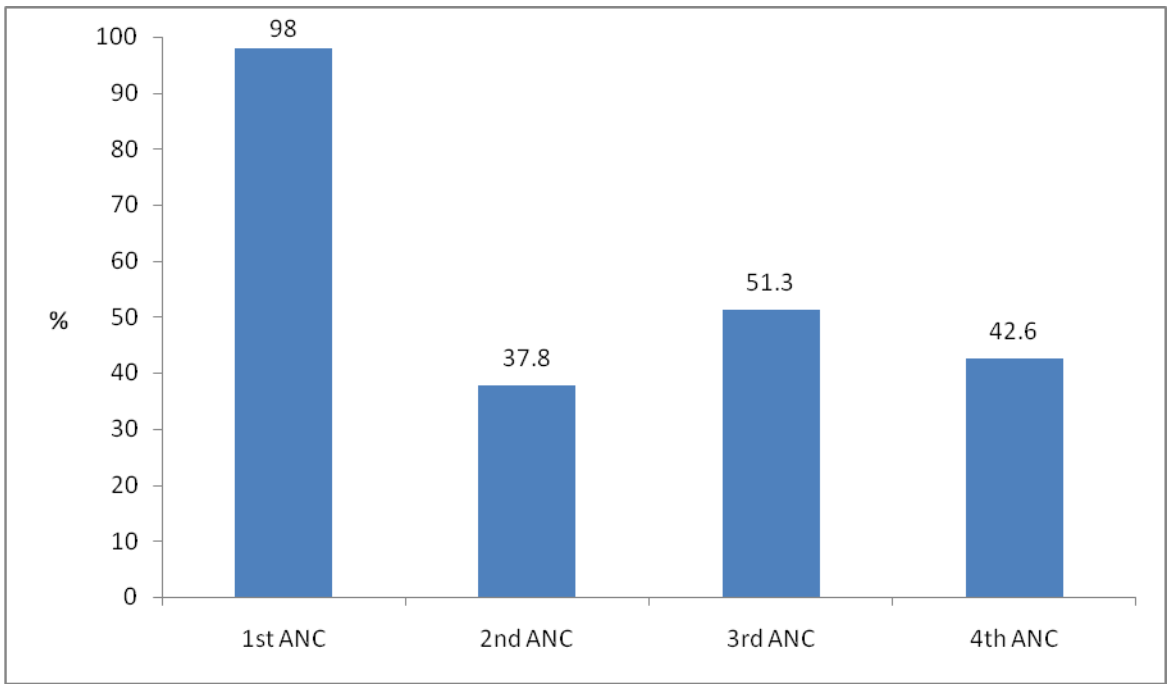

Figure 12: Distribution of hemoglobin count screening across ANC schedule

Majority of the clients (over 97%) were screened for proteins in urine, dropping through the 2nd and 3RD visit only to pick up again during the 4th ANC (23.%)

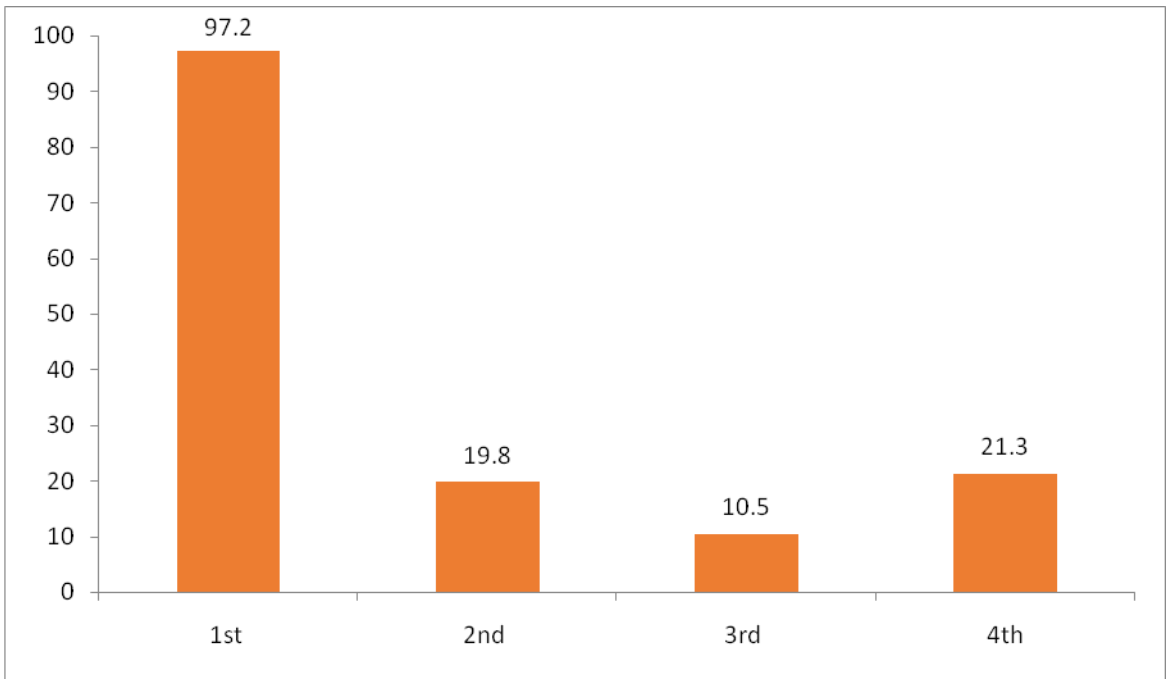

Figure 13: Distribution of Urinalysis screening

Majority of the clients were not screened for danger signs across the ANC visits

Majority of the clients were not screened for danger signs across the ANC

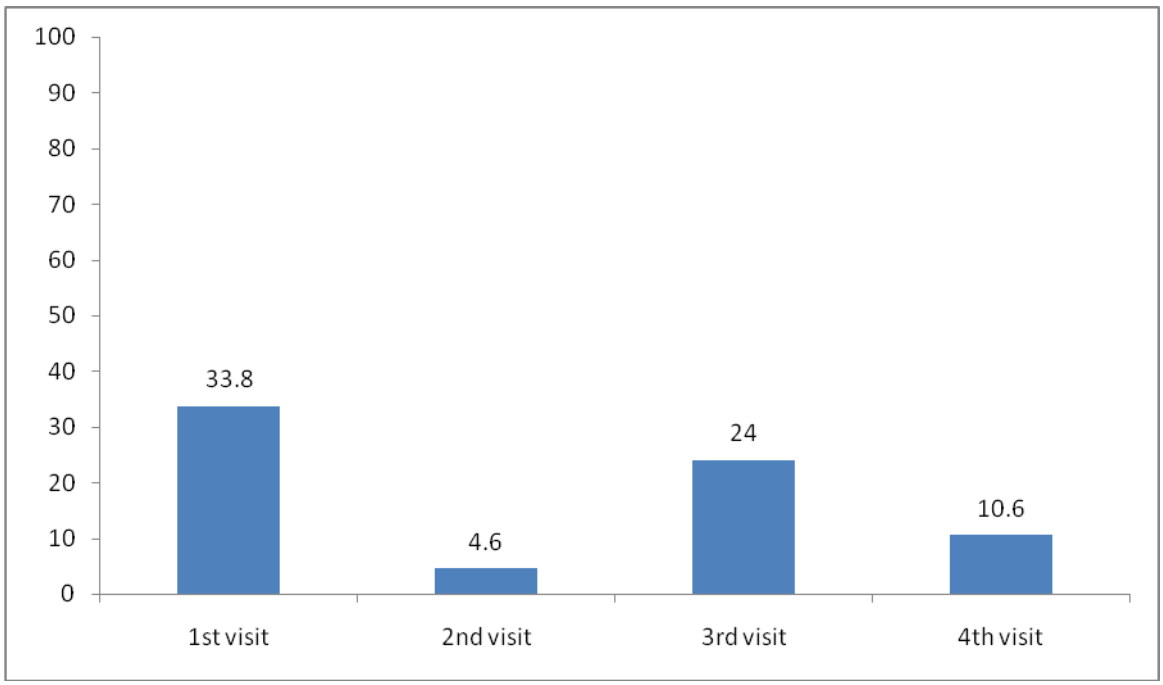

Figure 14: Distribution of danger signs

All the clients were palpated across the Four ANC

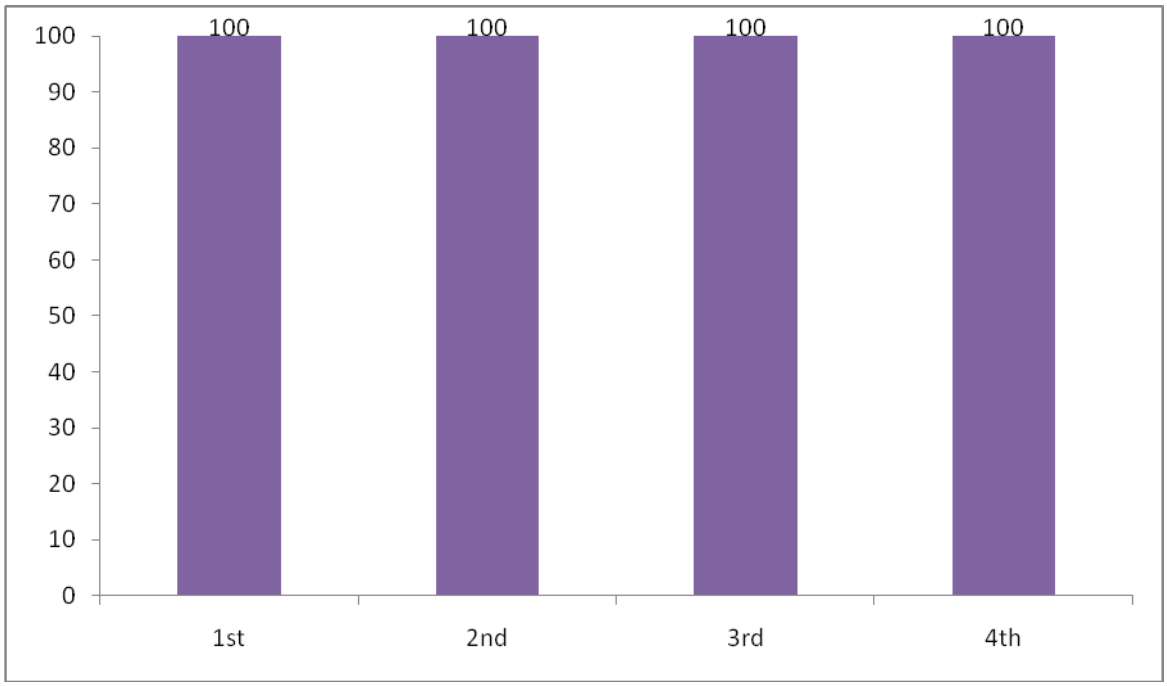

Figure 15: Distribution by palpation

Majority of the clients (over 80%) were asked when their last delivery took place

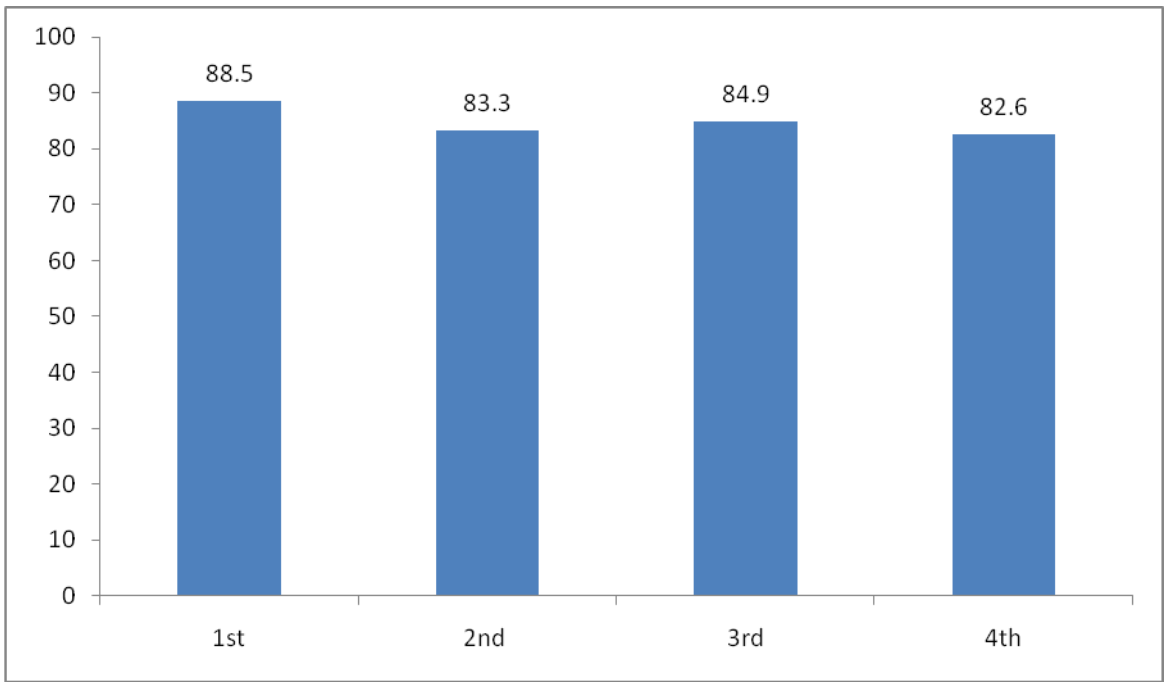

Figure 16: Distribution by history of last delivery

During the first ANC visit, majority of the clients were in their second trimester (61%), 31% were in their first, while 7.8 % came in during the third trimester. During the 4th ANC visit, only 13.3% were in the third trimester. However 51% came for the 4th ANC during the first trimester, indicating that they were likely to do more than the recommended four ANC visits.

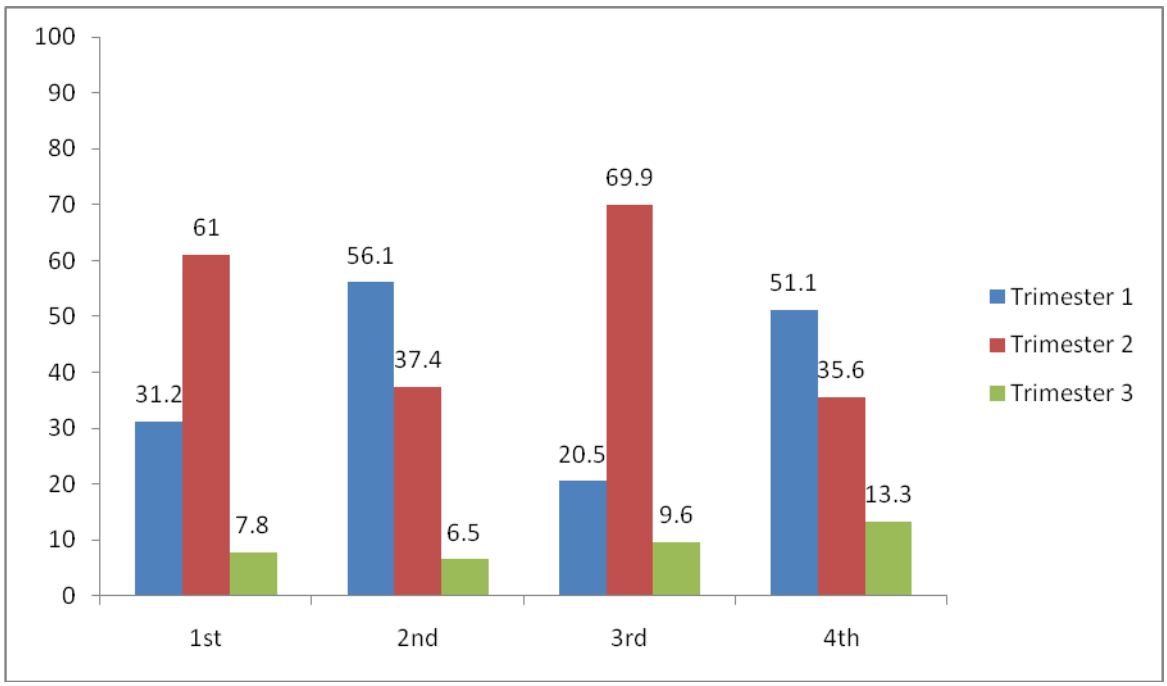

Figure 17: Distribution gestation period

Majority (46 %) of the midwives were aged between 51-60 yrs, 45% were those between 41-50yrs and only 9% were between 31-40 yrs

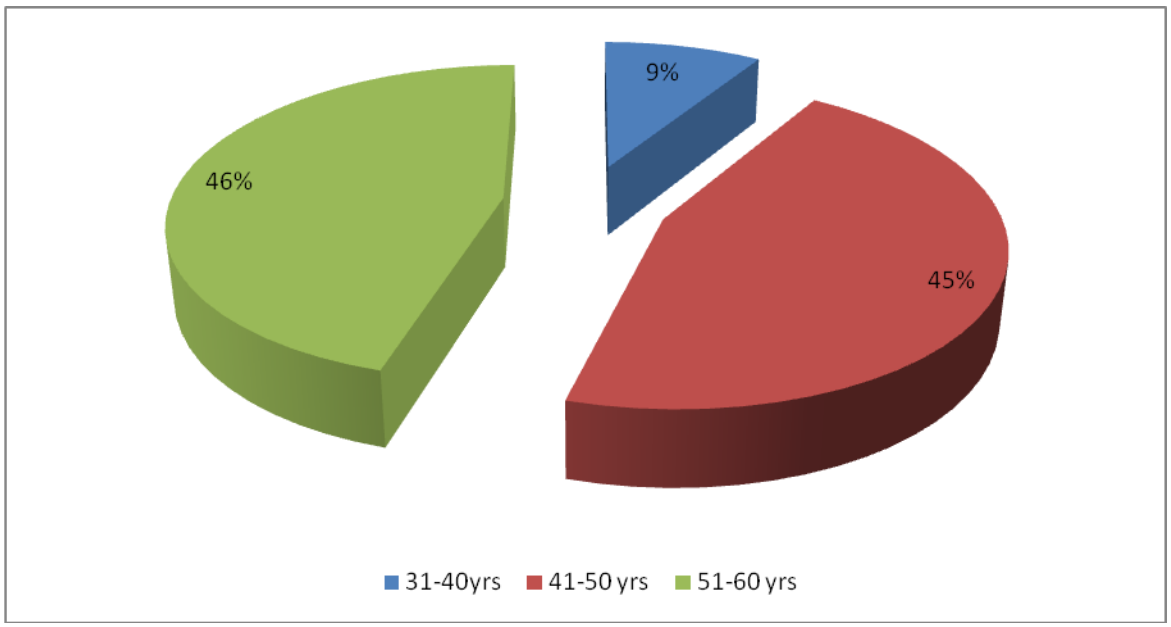

Figure18: Midwives Age

Majority (55%) of the skilled birth attendants were diploma holders while only 9% were degree holders

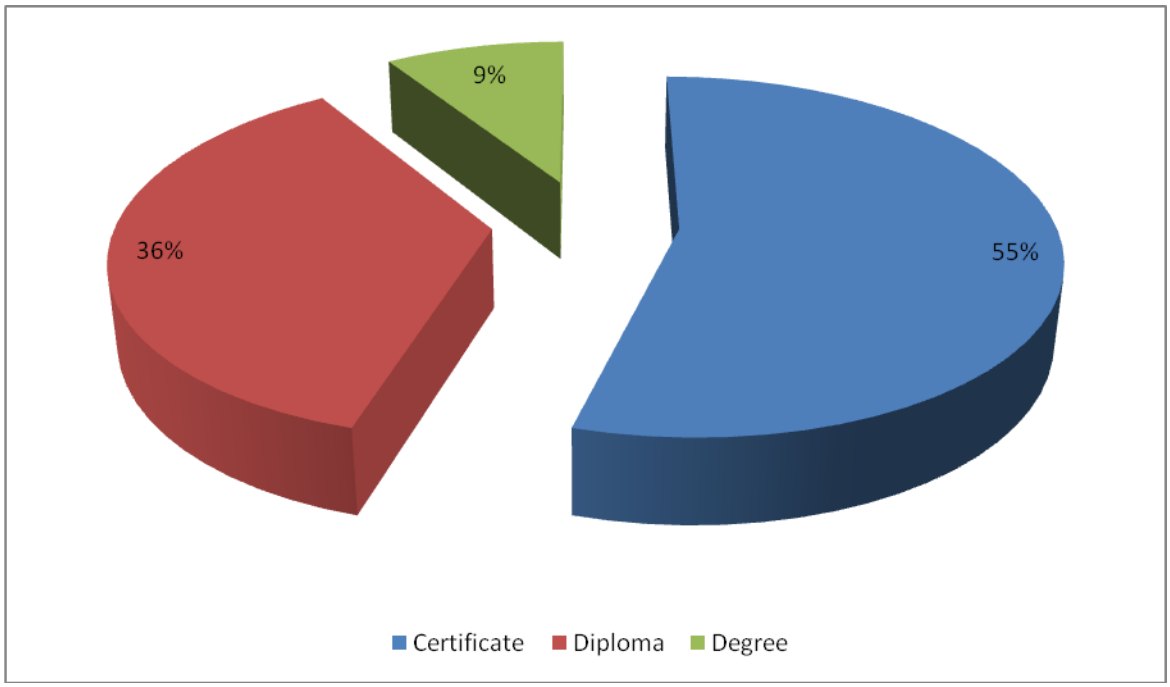

Figure 19: Level of education

About 27.3% of the skilled birth attendants had served in the ministry for 21-25 yrs, equally with those who had been in service for between 26-30 yrs

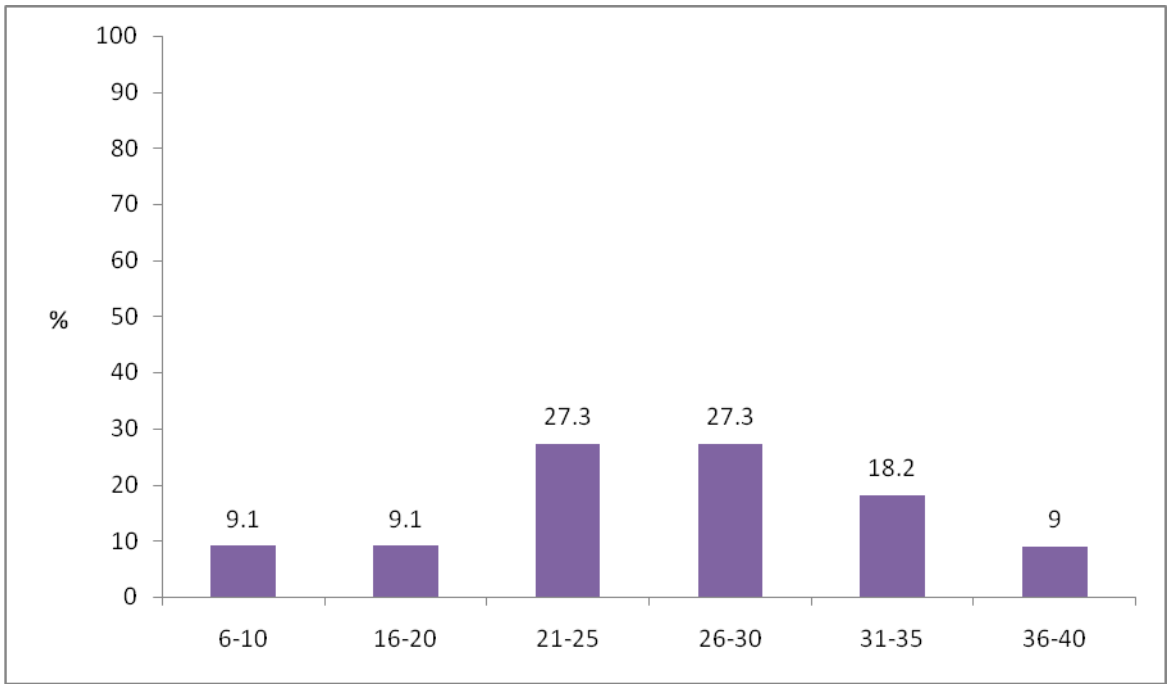

Figure20: Duration of service as a midwife

Table 3: Provider demographic factors influencing provision of Pre-eclampsia screening services

Characteristic	F-value	P-value
Age-group	2.574	0.137
Education level	1.956	0.203
Experience in years	17.165	0.004

Among the midwives demographic factors, experience in years was significantly associated with provision of effective pre-eclapmpsia screening services (F=17.165, p=0.004) as indicated in table 4.1. Those who were experienced had higher mean score on the provision of services implying the likelihood that they provide the services.

Lack or non-functional equipments (BP machine) 5(45.5%) and increased workload 6(54.5%) were reported as the facility related factors hindering provision of pre-eclampsia screening services

CHAPTER FIVE

5.0 DISCUSSION

The study established that preeclampsia screening services were being offered to pregnant women attending antenatal clinic in BCRH. The study agrees with Fraser *et al,* (2010) and Uzan *et al* (2011) since pre-eclampsia is unlikely to be prevented, screening for preeclampsia by the skilled birth attendants is important so that monitoring and treatment can be offered to those at risk to reduce severity of the disease for better pregnancy outcomes.

According to Poon & Nicolaides (2014) screening by combination of maternal risk factors can identify about 95 % of case for patients at risk for preeclampsia. Therefore agreeing with Poon & Nicolaides, it was established in this study that the following preeclampsia screening services were offered to the antenatal clients: Social demographic data: Age, education, marital status, employment; Physical examination: blood pressure monitoring, weight monitoring, head to toe examination and abdominal palpation; laboratory tests to include: Haemoglobin level and urinalysis; health education on danger signs to include: blurred vision, severe headache, epigastric pain among others. The study agrees with following studies which emphasis on the preeclampsia screening during antenatal period Duley *et al* (2006) and Maternal Guidelines Development Group Therapeutic Committee (2010). Churchill, (2013) and Akolekar,Syngelaki, Sarquis, Zvanca, & Nicolides (2011) agree with this study that Pre-eclampsia presents in several ways, therefore health providers have to be vigilant so that all pregnant women are screened for preeclampsia.

The study also established that other preeclampsia screening services offered to ANC mothers included obstetric history; history of twins, previous history of preeclampsia, history for chronic medical illness and history of smoking. This is in line with Wagner *et al., (*2004) and Osungbade & Ige, (2011) who report that baseline investigations for preeclampsia should be performed early in pregnancy for all women to determine pregnant women at risk

The study established out that a lot of emphasis was put on blood pressure monitoring (99%); obstetric history 96%, history of chronic medical illness (94%) and history of twins (89%). The findings are higher than those found in a retrospective study done in Tanzania (Fraser *et a.l,* 2010), where screening for blood pressure was 85% while proteinuria was 33%.The free antenatal services given to pregnant women in Kenya in all public hospitals could be basis for the increase in this study.

Age

Clients were screened for their ages. The majority (34%) of the clients were aged between 21-25 years while those aged less than 20 years (24%) and over 40 years were 1.5%. The study corresponds with MOPHS & MOMS (2010); Tebeu, Foumane, Mbu, Fosso, Biyaga, & Fomulu, (2011), and Gesami, (2013) that screening the age of a client assist in identifying risk factors since preeclampsia is prone to pregnant women aged below 20 years and those above 35 years old.

Education

Majority (over 97%) of the clients had a minimum of primary education. The findings are slightly higher the 88% found by KDHS (2014) and that those educated are likely to participate in decision making concerning their health (*ibid*). The study tallies with KDHS (2008-9) which states that Women's education is associated with antenatal care coverage. Women with education are much more likely to receive care from a skilled provider than those with no education. Illiteracy increases the chances of one developing pre-eclampsia in pregnancy, a precursor of preconscious marriage and limited access to health care (Tebeu *et al.*, 2011). Those with no education this study (2.7%) were low compared to 7% by KDHS (2014) and that illiteracy does not allow for urgency to seek for health care even during a complication is an afterthought and high level of education cushions pre-eclampsia (Kashanian *et al.*, 2011).

Employment

The study reveals that majority (56.4%) of the pregnant women had informal source of income while those with formal income were 16.5%. The findings are lower than the 75% rate of employment found by KDHS (2014). According to Tebeu *et al.*, (2011) housewives are at increased risk for developing pre-eclampsia, although working women have also adverse outcome. Working women have 2.3 times the risk of developing preeclampsia compared with non working women. Studies show that relative risk for pre-eclampsia is increased in many stressful situations. Many risk factors for pre-eclampsia are stress related. Low-stress situation is cushion for pre-eclampsia (Shamsi *et al* 2013).

Marital status

Majority (91%) of the clients were married while 9% were single. The findings are low compared to 59% by Bilano, Ota, Ganchimeg, Mori & Souza (2014).

Obstetric history

Parity

Documentation of the majority (more than 80%) of the participants' parity was documented. The study established that parity of the pregnant women who attended the ANC at the BCRH was taken and documented. Generally 64.8% were multipara while 35% were nullipara. According to Uzan *et al* (2011) pre-eclampsia affects 3% -7% of the nullipara and1%- 3% of the multipara.

The study agrees with Tebeu *et al.*, (2011) and Kashanian *et al* (2011) that parity is a risk factor and preeclampsia is more common in nulliparity (first time mothers) and grand multiparity (pregnant women with more than three children). Nulliparous woman has two fold risks for pre-eclampsia compared to multiparous.

Majority (72%) of those aged between 21-25 years were first time mothers only 27% were multipara. Only 2% of the participants aged below 20 years had more than three children. Fertility decreases by education where by women with no education has an average of 7 children while those with secondary education and higher have an average of three children (KDHS, 2014).

Time interval between pregnancies

Majority of the clients (over 80%) were asked about the time interval since their last delivery (child spacing). Establishing the interval since the last delivery helps in determining if the client is at risk for preeclampsia. The study concurs with Basso *et al* (2001)who states that long inter pregnancy interval is associated with a higher risk of pre-eclampsia in women with no previous pre-eclampsia. More than ten years since the last delivery is a significant risk factor for pre-eclampsia (MOMS & MOPHS, 2010; Duckitt & Harrington, 2005)

History of preeclampsia in previous pregnancy

In this study, 65% were screened for history of preeclampsia in the previous pregnancy (ies). According to MOMs & MOPHS (2010) and Milne *et al*, (2005) previous pre-eclampsia is associated with early onset of pre-eclampsia in the current pregnancy that may result in to adverse perinatal outcomes and therefore the importance of screening clients. Family history of pre-eclampsia increases a woman's risk of developing pre-eclampsia herself (Pre-eclampsia Foundation, 2006). The study agrees with Simon *et al* (2013) and MOMS/MOPHS (2010) that health care worker should document the occurrence of preeclampsia during previous pregnancies.

Cigarrete smoking

The number of women screened for smoking during pregnancy was 0.8 %.The findings are lower to those by Shamsi *et al (* 2013) who recommends that all antenatal clients should be screened for smoking since perinatal out comes are significantly worsened among preeclampsia clients who smoked cigarette. The poor

screening habit for smoking could also be as a result of the strong African culture that women should not smoke.

Physical examination

All (100%) of the participants were done physical examination including abdominal palpation. The study supports Bell (2010) who states that since effective measures and screening tools for preeclampsia are presently inadequate, routine nursing assessment of the signs and symptoms indicative of pre-eclampsia or eclampsia remain critical to the detection, monitoring and effective management of the pre-eclampsia.

The findings in this study strongly agrees with Wagner, (2004) that fundal height should be measured at each prenatal visit, because size less than dates may indicate intrauterine growth restriction or reduced amniotic fluid for the baby due to pre-eclampsia, these complications may become apparent long before diagnostic criteria for preeclampsia are met. Intrauterine growth restriction is considered major complication of pre-eclampsia (Maternal Guidelines Developmental Group Therapeutics Committee, 2010).

Blood pressure monitoring

Majority (99%) of the clients had their blood pressure taken during the antenatal visits.The findings agree with KDHS (2014) that all pregnant women were taken Blood pressure. However this findings are slightly lower than those found in a retrospective study done in Tanzania, where screening for blood pressure was 85% (Urassa *et al*., 2006). Measurement of blood pressure is the major factor to screening

for pre-eclampsia and part of routine antenatal care, whose aim is to create awareness on the importance of high blood pressure (Duley *et al.,* 2009). Accurate monitoring of Blood pressure importance (Poon & Nicolaide, 2014)

Weight monitoring

Sharing of danger signs in pregnancy

Majority (over 95%) of the clients were not informed about the danger signs in pregnancies which include severe headache, drowsiness, mental confusion, epigastric pain, nausea/ vomiting, a sharp rise in blood pressure, abdominal pains, generalized body swelling and convulsions. The findings are lower than the 58% by KDHS (2014). The findings call for emphasis on sharing of danger signs during pregnancy (MOMS &MOPHS, 2008; and National Guidelines for Obstetrics care and Neonatal Care, 2010). All pregnant women should be informed about danger signs in pregnancy (KDHS, 2003). Education of pregnant women on danger signs is among the aims of antenatal care (Baker, 2006). Pregnant women should therefore receive routine information on signs of complications for pre-eclampsia (KDHS, 2008-9)

Hemoglobin level estimation

64.9% of the participants in this study were screened for haemoglobin level compared to 100% by KDHS (2014). However the trend of findings was slightly higher than the 53% found by KDHS (2003). The complete blood count is helpful where the major signs of preeclampsia are absent; Proteinuria and hypertension (Fraser *et a.l*, 2010).

The distribution of the antenatal visits

The distribution of ANC visits among the participants decreased steadily from the first to the fourth visit and so was the trend for preeclampsia screening services. The findings agree with Duley *et al* (2006)), which indicates that Preeclampsia screening should be initiated when a prenatal client goes for her first booking at the hospital, screening is based on history taking, physical examination, Laboratory examination of the client's urine and sharing of health message on danger signs .

While Duley *et al* (2006) advocates for early initiation of antenatal care, before the 16th week while in this study majority (61%) of the participants had their first prenatal visit during the second trimester. 7.8% of the clients made their first ANC visit during the third trimester (very late), which concurs with WHO (2005) that pregnant women make their first consultation late in pregnancy. Pregnant women should initiate ANC visits early so as to fully benefit from the services provided across the four schedules of ANC visits.

General trend in Preeclampsia screening services across the FANC visits

In this study the percentage of clients reduced from first visit to the fourth visit respectively as follows: 39.5%, 29%, 19.5% and 12.05%. Thus the preeclampsia screening services also decreased gradually through the antenatal visits. This was due to late initiation of antenatal clinic attendance that makes the pregnant women not to attain the four scheduled visits. The findings agree with Poon & Nicolaides (2014) that women should be screened for risk factors for preeclampsia across the ANC visit, however in this study the number were declining respectively. The findings are contrary to the National Guidelines for quality Obstetric and Perinatal Care (2010)

which recommends early clinic attendance, as early as before the 16th week of pregnancy so as to complete the four scheduled ANC visits. The early Antenatal initiation promotes achievement of the recommended four visits. Focused antenatal care (FANC) requires that a pregnant woman with no complications makes at least four visit to the clinic during pregnancy (Magonna *et al* 2011; WHO, 2005).

A bout 8% of the clients did their booking visit in third trimester which makes it hard for them to be screened effectively for preeclampsia. The finding corresponds with Urassa *et al., (*2006) that late booking for antenatal, common in many African countries may adversely influence the identification of early onset of pre-eclampsia since women who develop eclampsia make fewer visits to antenatal clinic. More worrying to the late ANC attendance is that eclampsia occurs mostly in unbooked mothers (Onu & Aisien, 2004). Not having had any antenatal care is a consistent risk factor for adverse outcome of eclampsia (Duley & Henderson-Smart, 2009). Women who do not receive antenatal care are more likely to die from complications of pre-eclampsia (Lewis & Drife, 2001 in Fraser *et al.,* 2010) than woman who had received any level of prenatal care (Mackay *et al,* 2001). Therefore pregnant women should receive antenatal care to reduce maternal and new born mortalities and improve in the outcome (WHO, 2005) an emphasis of this study.

According to Baker, (2006) antenatal care aims at prevention, promotion, detection and management of factors that adversely affect the health of a mother and the baby and to provide general health screening including surveillance for pre-eclampsia.

Uptake of Antenatal Care services in relation to the trimester

About 31% of women obtained first antenatal care services during the first trimester of pregnancy, which is higher than the 20% by KDHS (2014). Majority (61%) of the pregnant women came for their first visit in their second trimester, which agrees with Pell *et al* (2013) that majority of pregnant women make their first ANC visit during the sixth month of pregnancy hindering effective pre-eclampsia screening. The findings fall below recommendation by KDHS, (2008-9) and Magonna *et al.* (2011) that the first antenatal visit should occur within the first trimester of pregnancy and in less than 16 weeks gestation. Antenatal care can be more effective in preventing adverse pregnancy outcomes when it is sought early in pregnancy and early detection of problems in pregnancy leads to more timely referrals (Chelagat, *et al.*, 2011).

It was realized that only 13% of the pregnant women had four of the scheduled ANC visits; a low figure compared to 60% (KDHS, 2014), 47% found by KDHS (2008-9) and 44% by Pell *et al* (2013) respectively. The findings in this study agree with the below statement that, "worrying is the declining number of women who seek antenatal care having dropped" (KDHS, 2008-9) and most women make their first visit when the pregnancy is about six months (KDHS, 2008-9; Magonna, *et al.*, 2011). The findings in this study that only 13% attain the fourth ANC visit is far much below those found by United Nations (2015) that only half of the pregnant in developing countries receive the recommended minimum of four ANC visits.

Most services were majorly done during the first ANC visit and gradually decreased in the subsequent visits respectively. The study reveals that since most women come

in late for their first ANC visit, they do not accomplish four visits since they delivered before the fourth visit. According to KDHS (2008-9) more interventions should be put in place to make pregnant women attend all the four scheduled ANC visits, sentiments that were reinforced by most (over 50%) skilled birth attendants in this study

Uptake of ANC in relation to Parity

Majority(64.9%) participants were primegravida women compared to multipara (35.14%).This could be due to lack of familiarity with signs and symptoms of pregnancy for first time mothers while multiparity clients visited the ANC in later pregnancy even during the ninth month, just to obtain ANC card. The findings agree KDHS (2014)

Lack/inadequate equipment for preeclampsia screening

In this study, provision of preeclampsia screening services was influenced by provider and facility related factors. The main significant provider factor was years of experience where majority (54%) of the skilled birth attendants were likely to screen for preeclampsia.

Among the facility related factors were lack or non-functional equipments (BP machine (45%) and urine dipsticks) and increased workload (54%) were reported as factors hindering provision of effective pre-eclampsia screening services

This finding are in congruent with McLntosh and Washington, (2010) that among factors that impede effective screening for pre-eclampsia is lack/ or inadequate equipment as evidenced by remarks of doctors in one of the Kenyan institution as they appealed for donation of equipment.,

"*It is frustrating to take care of patients with pre-eclampsia , offering close monitoring that is considered the standard of care in IndianaPolis is not available in Kenya due to lack of equipment*"). (McLntosh and Washington, 2010). Morris *et al., (*2013) Adds that the quickest method of checking for Proteinuria is by using reagent strips, a method that is quick, portable and easy to perform

Majority (F-value 17.165, P- value 0.004) of the skilled birth attendants highlighted experience as positive factor to effective preeclampsia screening, agrees with old adage that old is gold and experience is the best teacher.

The study establishes that although there were clients, the preeclampsia screening was not done effectively due to increased work load, lack of comprehensive checklist specific to each ANC visit. The findings are similar to a study done in Kenya by Koki Agarwal (2012) which showed that there are currently missed opportunities for pre-eclampsia screening during ANC and are likely due to inadequate policy implementation, to correctly screen for preeclampsia. Shankwaya (2008) recommends that supervision need to be stepped up to improve pre-eclampsia screening antenatally. WHO (2014) agrees with this study that on-the-job support of service providers through supervision is important to ensure that staff training is up to date and to keep staff interested and motivated, as well as to monitor performance and maintain quality of care. Knowledge and skills were not mentioned as impeding factors to effective preeclampsia screening in this study.

CHAPTER SIX

6.1 CONCLUSION AND RECOMMENDATIONS

Conclusion

The findings from this study show that pre-eclampsia screening services are offered to antenatal clients attending antenatal clinic in BCRH. The services include: social democratic data: age, education and source of income, obstretric history: parity, gravidity, gestational age at the first booking, birth order and history of twins, history of chronic medical illness: diabetes and hypertension, history of smoking and history of previous pre-eclampsia, Physical examination: blood pressure monitoring, weight monitoring, abdominal palpation and oedema. laboratory investigation: urinalysis and hemoglobin level. The preeclampsia services that are mostly done include obstetric history, history of twins, urinalysis, history of chronic medical illness, blood pressure monitoring, and hemoglobin level. The most conspicuously missing PE screening service was history of smoking which could be attributed to cultural perception that women rarely smoke. However the preeclampsia screening services decrease with subsequent FANC visits respectively, due to the reducing clients' numbers. Most clients initiate antenatal visits late in pregnancy (during the second and third trimester) and therefore end up not completing the four FANC visits since they will have delivered.

Midwives' years of experience were significant in this study. Midwives who have been in service for more than five years supported the idea of screening all clients for preeclampsia. Lack of equipment and workload were the major factors affecting the provision of pre-eclampsia screening services.

Recommendations

1. BCRH should post adequate midwives with at least five years experience to work in MCH /FP and ensure that midwives effectively screen pregnant women for PE across all the four FANC visits.
2. The hospital management should further equip the health facility with functional BP machines and provide sufficient dipsticks to aid in screening for PE.

Area for further research

Research should be carried out in the following areas; health care adherence to guidelines and protocols, the benefits of early ANC attendance in relation to prevention of preeclampsia and comparison of screening service in private and public hospitals in Kenya.

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APPENDICES

APPENDIX I: RESEARCH SCHEDULE

FIGURE 2: TIMELINE FOR STUDY

no	activity	time line	
1	submission of topic HOD	Sept/Oct/2012	
2	proposal of supervisors	by Dec/2012	
3	submission of topic	by 15/12/2012	
4	approval of topic by SONGSC	31/1/2013	
5	submission of topic/supervisors to senate	Feb./2013	
6	approval of topics/supervisors by senate	31/march/2013	
7	proposal seminar presented to SON	31/4/2013	
8	proposal presented to SON	24/10/2013	
9	proposal submitted to IREC	15/11/2013	
10	Data collection	June/2014	
11	Data analysis	July/2014	
13	Thesis writing	July/2014	
14	Draft completion thesis to supervisors	5/August/2014	

15	Thesis approval by supervisors	21/August/2014	
16	Submission of letter of intent to defend thesis to SONGSC	26/4/2016	
17	Mock defense	26/5/2016	
18	Revision on thesis	10/6/2016	
19	Thesis defense	10/7/2016	

APPENDIX II: RESEARCH BUDGET

no	Item	no	cost@	total	Total amo
1.	Questionnaire	30	30	900	1800
2	Checklists	384	20	7680	15360
3	Pens	10	12	220	220
4	Note books	3	50	150	150
5	Files	5	50	250	250
6	Pencils	6-HB	25	150	150
	Sharpener	6	10	60	60
7	Erasers	6	10	60	60
8	Travel expenses	3	1000	3000	3000
9	Lunches	4	500	2000*30	60000
10	Incidental allowance	4	200	800*30	24000
11	News prints paper	20	30	600	600
12	Felt pens	10	100	1000	1000
13	IREC FEE	1	1000	1000	1000
14	Rims printing papers	3	500	15000	1500

15	Printing of proposal drafts	4	1000	4000	4000
15	Printing thesis	4	2500	10,000	10,000
16	Flash disk	2	1000	2000	2000
12	Total				122450

APPENDIX III A: CONSENT FORM TO PARTICIPATE IN THE STUDY

INFORMED CONSENT FORM FOR THE CLIENT

I am Janepher Masai, from Moi University School of Nursing conducting a study ***on "The assessment of screening activities for pre-eclampsia among pregnant clients attending antenatal clinic in Bungoma County Referral Hospital***". The study is being carried out among pregnant women since pre-eclampsia occurs only in pregnant women. You have been randomly selected to participate in this study since you are expectant and your participation in this study is entirely voluntary. You are still entitled to services even if you choose not to participate in this study and there will be no victimization. This study has no risk to you and the expected baby as it will only involve collecting pregnancy related information from your antenatal booklet for a maximum of ten minutes. There will be no direct benefits to you as the client; since the purpose of this study is to find out if there are screening services for pre-eclampsia in this antenatal clinic and how these services are distributed across the antenatal visits. The results of the study will be used to inform the policy makers in both national and county government on how to effectively screen for preeclampsia during antenatal visits. Your name will not be included in the records and any information you give will be handled confidentially by the researcher and used only for the study purpose. You are free to withdraw at any time in the course of the study. In case of any questions and inquiries please call me on 0710550132.

I have read and understood this consent form and I am therefore willing to participate in this study.

Signature of client:…….

Signature of the interviewer:…….Date…….

FOMU YA IDHINI KWA WATEJA

Mimi ni Janepher Masai, kutoka Chuo Kikuu cha Moi Shule ya Uuguzi, nafanya utafiti juu ya "tathmini ya shughuli kwa ajili ya uchunguzi kabla ya pre-eclampsia miongoni mwa wateja wajawazito wanaohudhuria kliniki ya wajawazito katika Hospitali ya Rufaa Bungoma kaunti. Utafiti unaendeshwa kati ya wanawake wajawazito tangu kabla ya pre-eclampsia hutokea tu kwa wanawake wajawazito. Umekuwa nasibu kuchaguliwa kwa kushiriki katika utafiti huu tangu wewe ni mjamzito na ushiriki wako katika utafiti huu ni hiari kabisa. Wewe bado una haki ya huduma hata kama wewe utachagua kuto kushiriki katika utafiti huu na hakutakuwa na uonevu. Utafiti huu hauna hatari kwa wewe na mtoto unatarajiwa.Tutakusanya habari juu ya mimba kutoka kitabu chako cha kliniki kwa upeo wa dakika kumi. Hakutakuwa na faida ya moja kwa moja na wewe kama mteja; tangu lengo la somo hili ni kujua kama kuna huduma ya uchunguzi kwa kabla ya pre-eclampsia katika kliniki hii ya wajawazito na jinsi huduma hizi zinazambazwa katika ziara za wajawazito. Matokeo ya utafiti zitatumika kuwajulisha watunga sera katika kitaifa na serikali ya kaunti juu ya jinsi ya kuchunguza kwa pre-eclampsia wakati wa ziara za wajawazito. Jina lako halitahitajika na taarifa yoyote kutoa itakuwa kubebwa kwa siri na mtafiti na kutumika tu kwa ajili ya utafiti.Uko huru kuondoa wakati wowote katika kipindi cha utafiti. Katika kesi ya maswali yoyote na maoni tafadhali piga simu yangu juu ya 0710550132.

Nimesoma na kuelewa fomu hii ya idhini na niko tayari kushiriki katika utafiti huu.

Sahihi ya mteja: ..... Tarehe .....

Sahihi ya mhojaji: ..... Tarehe .....

APPENDIX 111 B

CONSENT FOR THE MIDWIFE

Hello,……..

Iam Janepher Masai, from Moi University. Iam conducting a study on screening activities for pre-eclampsia among pregnant clients attending antenatal clinic in Bungoma County Referral Hospital. Your participation in this study is voluntary. Your name will be anonymous and any information given will be confidential. The purpose of the study is to find out the screening services for Pre-eclampsia the hospital, how the services are distributed across the antenatal visits and factors influencing effective screening for PE. There are no risks involved in taking part in the study neither are there personal benefits. The results of the study will inform the policy makers in both the country and national governments and hence improve the screening services in health facilities. The study also is being carried out as a requirement for academic qualification.

Signature of client:…….Date…….Time……

Signature of the interviewer:…….Date…….Time……...

APPENDIX IV: RESEARCH TOOLS

APPENDIX IVA: CHECKLIST **SERIAL NO:…….**

ANTENATAL CHECKLIST FOR PRE-ECLAMPSIA- INSTRUCTION: Mark on the correct response against the provided option				
A. DEMOGRAPHIC DATA				
1	Antenatal visit no.	1	1st visit	
		2	2nd visit	
		3	3rd visit	
		4	4th visit	
2.	Maternal age done?	1	yes	
		2	no	
		1	< 20 years	
		2	21-25 years	
		3	26-30 years	
		4	31-35years	
		5	36-40 years	
		6	>41 years	
3.	Education done?	1	yes	
		2	no	
		1	primary	
		2	secondary	
		3	tertiary	
		4	None	

4.	Marital status done?	1	yes	
		2	no	
		1	married	
		2	single	
		3	widow	
5.	Source of income. done?	1	yes	
		1	no	
		1	formal	
		2	informal	
		3.	none	
B.	**obstetrics**			
6.	Obstetrical history done?	1	yes	
		2	no	
		1	Parity	
		2	Gravidity	
		3	L.M.P	
		4	E.D.D	
		3	G.B.D	
		4	Twins	
		5	Previous PE-discussion	
7.	Last delivery done?	1	yes	
		2	no	
8	Gestational age at booking done?	1	yes	

		2	no	
		1	1st trimester	
		2	2nd trimester	
		3	3rd trimester	
9	History of twins done?	1	yes	
		2	no	
10	History of previous PE done?	1	yes	
		2	no	
11	Chronic medical illness done?	1	yes	
		2	no	
		1	Hypertension	
		2	Diabetes	
		3	Renal disease	
		4	others	
12	History of smoking documented	1	yes	
		2	no	
13	Education on danger signs done	1	yes	
		2	no	
14.	Blood pressure monitoring done	1	yes	
		2	no	
15.	Weight monitoring done	1	yes	
		2	no	
16.	Abdominal palpation done	1	yes	

		2	no	
17.	Urinalysis done	1	yes	
		2	No	
18.	Complete blood count done(H.B)	1	yes	
		2	No	
19.	Any other response(specify)	1	Yes	
		2	No	
20	specify			

APPENDIX IVB: QUESTIONNAIRE FOR SKILLED BIRTH ATTENDANT

SERIAL NO:…….

Kindly answer the following questions, without consulting your colleague. Tick your response in the available box provided against your choice

Part A

Demographic Data

1. What is your age? 21-30 years ☐ 31-40 years ☐

   41-50 years ☐ 51-60 years ☐

2. What is your highest qualification? Certificate ☐ Diploma ☐

   Degree ☐ Others ☐

3. For how long have you worked as a skilled birth attendant?

   Less than 0-5 years ☐ 6-10 years ☐

11-15 years ☐ 16-20 years ☐

21-25 years ☐ 26-30 year ☐

PART B

Obstetric Practice

Please circle the number that best describes your choice about screening of PE for the antenatal clients in the antenatal clinic. The numbers represent the following responses:

1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

4. Demographic data should be taken from all the clients on

First visit	1	2	3	4	5
2nd visit	1	2	3	4	5
3rd visit	1	2	3	4	5
4th visit	1	2	3	4	5

Give your reason/s ……

5. Relevant history on PE should be taken on all pregnant women during-

First visit	1	2	3	4	5
2nd visit	1	2	3	4	5
3rd visit	1	2	3	4	5
4th visit	1	2	3	4	5

Give reason/s for your choice……..

6. Should physical examination be done to all clients on:

Ist visit	1	2	3	4	5
2nd visit	1	2	3	4	5
3rd visit	1	2	3	4	5
4th visit	1	2	3	4	5

Give reason/s for your choice……

7. Should BP monitoring be done to all clients during:

Ist visit	1	2	3	4	5
2nd visit	1	2	3	4	5
3rd visit	1	2	3	4	5

4th visit 1 2 3 4 5

Give reasons for your choice…….

Should urinalysis be done to all clients during:

Ist visit 1 2 3 4 5

2nd visit 1 2 3 4 5

3rd visit 1 2 3 4 5

4th visit 1 2 3 4 5

Give reason/s for your choice……..

8. Should (haemoglobin level) H.B be done to all clients during:

Ist visit 1 2 3 4 5

2nd visit 1 2 3 4 5

3rd visit 1 2 3 4 5

4th visit 1 2 3 4 5

Give reason/s for your choice

……

……

9. Should antenatal clients be educated on individual birth plan during:

Ist visit	1	2	3	4	5
2nd visit	1	2	3	4	5
3rd visit	1	2	3	4	5
4th visit	1	2	3	4	5

Give reason/s for your choice……

10. In your opinion , what are the facilitating factors to effective PE screening

11. In your opinion ,what are the factors hindering effective PE screening

APPENDIX V: REQUEST FOR PERMISSION FROM THE BUNGOMA COUNTY HOSPITAL

JANEPHER NAMAROME MASAI
MOI UNIVERSITY, SCHOOL OF NURSING
P.O BOX 4606
ELDORET, KENYA
21/02/2014

THE MEDICAL SUPERITENDENT,
BUNGOMA COUNTY REFERRAL HOSPITAL,
PO BOX 14,
BUNGOMA.

Dear sir/madam,

RE: REQUEST FOR PERMISSION TO CARRY OUT RESEARCH

I am a post graduate student at Moi University School of Nursing pursuing a Master of Science degree in nursing (MSc.N- Maternal and Neonatal Health). Iam undertaking a research on: "Assessment for pre-eclampsia screening among midwives in antenatal clinic in Bungoma County Hospital".

I hereby submit my humble request to carry out my study in your institution. The study shall be done in the antenatal clinic in the MCH department for a period of one month with effect from the approval date.

Thank you in advance.

Yours sincerely,

Janepher N.Masai

PGMNH/06/2012