

**ASSESSMENT OF ECLAMPSIA MANAGEMENT AMONG NURSES AND  
MIDWIVES IN SECONDARY HEALTH CARE FACILITIES IN  
BAUCHI STATE**

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**SEPTEMBER, 2018**

## **DECLARATION**

I declare that the work in this dissertation entitled Assessment of Eclampsia Management among Nurses and Midwives in Secondary Health Care Facilities in Bauchi State has been performed by me in the Department of Nursing Sciences, Faculty of Allied Health Sciences, Ahmadu Bello University, Zaria. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for another degree or diploma at this or any other institution.

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Maryam Adamu Garkuwa

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Date

## CERTIFICATION

This dissertation entitled “ASSESSMENT OF ECLAMPSIA MANAGEMENT AMONG NURSES AND MIDWIVES IN SECONDARY HEALTH CARE FACILITIES IN BAUCHI STATE”, NIGERIA by Maryam Adamu GARKUWA Meets the regulations governing the award of the degree of Master of Nursing Sciences (Maternal and Child Health) of the Ahmadu Bello University, and is approved for its’ contribution to knowledge and literary presentation.

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## **DEDICATION**

This dissertation is dedicated to the researcher's late father Alhaji Adamu Garkuwa, husband;  
DR. B.M. Tukur and her children; Muhammad, Fatima, Adam, Rukayyah and Bilkisu.

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## **LIST OF ABBREVIATIONS**

ACOG - American College of Obstetricians & Gynecologists

ANC – Ante Natal Care

BASSDP- Bauchi State Strategic Development Plan

Gm - Gram

HELLP Syndrome – Hemolysis Elevated Liver enzymes and Low Platelets count

IM – Intramuscular

IV – Intravenous

Jhpiego – John Hopkins Program for international education in Gynecology and Obstetrics

Mg - Milligram

MmHg - Millimeter of Mercury

MMR - Maternal Mortality Ratio

NDHS - Nigeria Demographic and Health Survey

NICE - National Institute for Clinical Excellence

P/E – Pre-eclampsia and Eclampsia

SD – Standard Deviation

SPSS – Statistical Package for Social Science

U.S.A - United States of American

USAID - United States Agency for International development

WHO - World Health Organization

## OPERATIONAL DEFINITION OF TERMS

**Barriers** – These are challenges faced by nurses and midwives that prevent them from providing effective management to pre-eclampsia and eclampsia patients.

**Eclampsia** – Meaning pre-eclampsia and eclampsia.

**Knowledge**- knowing about a condition or general understanding about pre-eclampsia and eclampsia including the causative factors, management and its adverse outcome.

**Nurses and midwives** – An individual that acquire knowledge in midwifery or double qualification and has the basic skills, licensed by nursing and Midwifery council of Nigeria to provide services in the maternity units.

**Patient** – An individual who develop pre-eclampsia and eclampsia and receives management from nurses and midwives during pregnancy, delivery or puerperium.

**Pre - eclampsia** – A condition developed during pregnancy presented with high blood pressure, proteinuria with or without edema.

**Resources** – Include human and material resources in providing management to pre-eclampsia and eclampsia patients.

**Skills** - A state of being able to or ability carry out routine procedures effectively to avoid adverse outcome of pre-eclampsia and eclampsia by a well-trained person.

## ABSTRACT

Pre-eclampsia and eclampsia is one of the problems affecting women during pregnancy, labour and puerperium and is among the leading factors that causes maternal and perinatal mortality and morbidity in Bauchi state. The study aimed at assessment of pre-eclampsia and eclampsia management among nurses and midwives in secondary health care facilities in Bauchi state. It was observed that women with pre-eclampsia and eclampsia develop life threatening complications. These include; acute renal failure, Hemolysis Elevated Liver Enzymes and Low Platelets Count Syndrome, Respiratory distress syndrome and Abruption placentae. Fetal complication includes; birth asphyxia, preterm birth, intrauterine growth restriction and intrauterine fetal demise among others. The objectives of the study were; to determine the level of knowledge in management of pre-eclampsia and eclampsia among nurses and midwives, to assess nurses and midwives' skills in management of pre-eclampsia and eclampsia patient and to assess the availability of resources for management of pre-eclampsia and eclampsia among others. Cross sectional descriptive research design was used in the study. This research was carried out in secondary health care facilities in Bauchi state. The population of this study comprised of nurses and midwives in maternity units of all the secondary health care facilities in Bauchi state. Census sample of 116 respondents was used to recruit all the nurses and midwives in the study. Triangulation was used for data collection, this included self-interviewer questionnaire comprising of sections: A, B and E and observational checklist adapted from Johns Hopkin Program for International Education in Gynecology and Obstetrics (Jhpiego) was used in sections C and D, scoring system used in the study consisted of two and three point scales respectively. Descriptive and inferential statistics were used to analyzed the data and was coded using excel and Statistical Package for Social Science version 23.0. Results were presented in the form of frequency tabulation and chi-square was used to test relationship between variables at p-value of 0.05 or less. The result revealed that the participants possessed fair knowledge (53.7%). Findings showed that there was availability of resources but not functional (Mean=1.4). The challenges faced by the respondents while providing services to the patients, work overload has the highest responses (90.5%), followed by resources not available (84.2%), availability of nurses and midwives (77.9%), conducive environment (66.3%) and delay in referrals (64.2%), The least challenge faced by the respondents was salary and wages (31.6%). It can be concluded that based on these findings nurses and midwives have had fair knowledge in management of pre-eclampsia and eclampsia patients. It was observed that the study respondents' skills were satisfactory in providing the management among others. It was recommended that nurses and midwives should be given adequate opportunity for further education and training to acquire more knowledge identification, prompt diagnosis and effective management of pre-eclampsia and eclampsia patients through seminars and workshops in order to minimized adverse outcome.

Key words: Assessment, Eclampsia Management, Nurses, Midwives, Health facilities.



## CHAPTER ONE

### INTRODUCTION

#### 1.0 Background

Many factors or medical conditions may influence the outcome of pregnancy, which in turn, may increase perinatal and maternal morbidity and mortality. One such condition is pre-eclampsia and eclampsia, which is characterized by an increase in blood pressure (BP), seizure, severe headache and edema (Marshall & Raynor, 2016).

Pre-eclampsia is a pregnancy-specific disorder characterized by hypertension, significant proteinuria, with or without edema (Kooffreh, Ekott&Ekpoudom, 2014). Pre-eclampsia is the most common complication that occurs during pregnancy. It generally develops during the second trimester and affects about 1 in 20 pregnancies (Nordqvist & Liberto, 2017). It is multifactorial and forms an integral part of the continuum of hypertensive disorders of pregnancy. The end stage of pre-eclampsia is eclampsia (Kooffreh,*et al.*,2014). Pre-eclampsia is a disorder associated with high blood pressure and proteinuria during pregnancy (Bigdeli, Zafar, Assad & Ghaffar, 2013).

Pre-eclampsia is one of the most common complications of pregnancy and continues to be a leading cause of death and disability globally. It is characterized by new onset of hypertension and proteinuria after 20 weeks gestation. It may progress to eclampsia; a potentially lethal complication characterized by convulsions requiring an emergency response (Akeju, Vidler, Oladapo, Sawchuck, Qureshi, Dadelszen & Adetoro, 2016).

Pre-eclampsia is a multi-systemic disorder characterized by hypertension and new-onset proteinuria which develops after the 20th week of pregnancy (Ajah, Ozonu, Ezeonu, Lawani,

Obuna&Onwe, 2016). However, even when there is no proteinuria which meets or exceeds the diagnostic threshold, any of the following conditions can be diagnostic, new-onset thrombocytopenia, impaired liver function, renal insufficiency, pulmonary edema, or visual or cerebral disturbances (Ajah,*et al.*, 2016). The cause of pre-eclampsia is still unknown, the risk factors associated with pre-eclampsia include the following, genetic factors, poor maternal nutrition, primigravida, new paternity, maternal age, obesity, multiple gestation, family history and personal history of pre-eclampsia (Nordqvist & Liberto, 2017).For a diagnosis of pre-eclampsia to be made, the following should be tested positive; a blood pressure reading above 140/90 millimeters of mercury is abnormal in pregnancy, a blood test and urine test are both necessary to diagnose preeclampsia (Nordqvist & Liberto, 2017). Health care professional should order blood tests to check the platelet count, liver function, and kidney function. They will also check a urine sample or a 24-hour urine collection to check for protein in the urine, the wellbeing of the fetus should also be checked (Stoppler & Davis, 2018).

Nurses are the first professionals to have contact with pregnant women in obstetric emergency, so it is essential that nursing care is guided by current scientific evidence. The collection of detailed data, careful physical examination, administering oxygen, attention to blood pressure values, magnesium sulfate therapy and other pre-eclampsia signals; early detection of cases; Health education throughout pregnancy and childbirth, hospital discharge are actions that if carried out, ensure excellence of care and the reduction of maternal and fetal morbidity and mortality (Munirathnamma & Lakshamma, 2013).

Treatment of pre-eclampsia include the following; Antihypertensives, anticonvulsants and Corticosteroids (Nordqvist & Liberto, 2017). Pre-eclampsia has no cure except for delivery of the baby. However, delivery may not always be the best option at the time pre-eclampsia is

diagnosed. The treatment depends on the severity of the condition, these include; corticosteroids for fetal lungs maturation, bed rest and closed maternal and fetal observation, antihypertensives, magnesium sulphate, induction and delivery of the fetus (Stoppler & Davis, 2018). Its complications of pre-eclampsia may include: Eclampsia, other organ damage, HELLP syndrome, placental abruption, fetal growth restriction and preterm birth (Mayo Staffs, 2018). Complications of severe pre-eclampsia include the following; pulmonary edema, abruption placentae, impaired kidney function, bleeding problems, liver damage, death and birth asphyxia (Nordqvist & Liberto, 2017).

Eclampsia is defined by generalized tonic-clonic seizures, with or without raised blood pressure and proteinuria, occurring during or after pregnancy with or without other identifiable cause. The cause is still unknown but usually multifactorial including cerebral vasoconstriction, ischemia, vasogenic edema, or other pathology (Kooffreh, *et al.*, 2014). It is one of the serious obstetric emergencies seen in our sub-region and it is defined as new onset of grand mal seizure activity and/or unexplained coma during pregnancy or postpartum in a woman with signs or symptoms of pre-eclampsia (Ajah, *et al.*, 2016). It often presents with few warning signs and might occur in a patient with previously mild disease and therefore predicting its occurrence is as difficult as predicting the timing. Its earliest symptoms of eclampsia are hypertension, protein in the urine and edema, when symptoms advanced, headache, blurred vision and bloating among others. Primary symptoms of eclampsia are seizures in pregnancy, labour or within 42 days postpartum in a woman who does not have a history of epilepsy. The syndrome of pre-eclampsia can affect all maternal organ systems, but it is usually detected by the presence of new hypertension, proteinuria, and edema in pregnancy (Ginzburg & Wolf, 2009). Risk factors for eclampsia include family history of eclampsia or previous history of pre-eclampsia and eclampsia, teenage pregnancy, patient older than 35 years, multi-fetal gestation, primigravida and poor outcome of

previous pregnancies including intrauterine growth retardation, abruption in placenta and fetal death (Mattar&Sibai, 2000). When symptoms advance, headache, blurred vision and bloating develop. Other symptoms of eclampsia include muscle aches and pain, agitation, loss of consciousness and stroke, coma and death can occur to a mother and fetus (Ginzburg & Wolff, 2009).

The incidence varies worldwide ranging from 1 in 100 to 1 in 3448 pregnancies (Yakasai &Gaya, 2011). In Nigeria, rates vary between 0.3/100 deliveries in Calabar, Southern Nigeria, to as high as 9/100 deliveries in Birnin Kudu, Northern Nigeria, and in general, the rates are higher in the North than in the South. Eclampsia usually develop following pre-eclampsia that can be detected and managed before the onset of convulsion, except in a few cases where convulsion occur without the onset of detectable pre-eclampsia (Yakasai&Gaya, 2011). In obstetrics, good outcomes are expected while adverse outcomes are often considered unavoidable because trends and causes may be difficult to discern without a formal tracking program (Pettker, Thung & Norwitz 2009).

It is imperative that health professionals in secondary healthcare have the required knowledge about specific avoidable conditions during pregnancy especially nurses and midwives (Stellenberg & Ngwekazi, 2016). This will enable them to assess, diagnose and manage the pregnant woman efficiently and effectively to ensure that infant and maternal morbidity and mortality rates are kept at a minimum. The combined efforts of nurses and other health care related personnel will contribute very much to attainment of Sustainable Development Goal (SDG) 3. It is expected that by 2030, there will be global reduction of maternal mortality ratio to less than 70 per 100,000 live births. Ensure healthy lives and promote well-being for all at all ages, goal 3 (Sustainable Development Goals, 2015). Nurses are the first professionals to have

contact with pregnant women in obstetric emergency, so it is essential that nursing care is guided by current scientific evidence (Ferreira, Silveira, Silva, Souza, Ruiz, 2016). The collection of detailed data, careful physical examination and attention to blood pressure values and other pre-eclampsia signals; early detection of cases; the collection and monitoring of relevant laboratory tests, especially 24 hour proteinuria and fetal assessment (Ferreira, *et al.*, 2016). Intervention includes primary prevention, detection of increased risk and early detection of any stage of pregnancy induced hypertension by antenatal adequate care. Secondary prevention of progression is by treatment at primary level or referral for expert care. Caring of a primigravida with eclampsia is a challenge to any midwife, the midwives keen observation, prompt decision-making-ability to use lifesaving procedures and referral to the right place, at the right time, can save the mother and the baby (Mohammed & Mbitsa, 2015).

Pre-eclampsia and eclampsia are hypertensive disorders of pregnancy constitute major threats to maternal health throughout pregnancy especially in developing countries. Poor health systems, lack of trained staff and quality of care, low levels of education, are some of the factors contributing to the high maternal morbidity and mortality (United State Agency for International Development (USAID), 2016). In Nigeria, Pre-eclampsia and eclampsia is the leading cause of maternal mortality and is responsible for 28.2% of maternal deaths (USAID, 2016). Eclampsia accounts for a significant number of maternal deaths in Africa and Asia and about a quarter of maternal deaths in Latin America and the Caribbean. In some parts of Northern Nigeria, eclampsia alone contributed to almost one-third of maternal deaths (Esike, Chukwuemeka, Anozie, Eze, Aluka & Twomey, 2017). In Nigeria, the incidence varies from 3 to 17 per 1000 deliveries (Agida, Adeka & Jibril, 2018).

The major component in the healthcare delivery system of Nigeria comprises the tertiary i.e. Teaching hospitals and federal medical centers, and the secondary which is made up of specialist hospital and general hospital. There is a third, lower cadre health facilities known as primary health facilities which include dispensaries, health clinics and maternities (Madaki, 2014).

### **1.1 Statement of Problem**

The incidence of hypertensive disorders of pregnancy varies in the range of 1-35% around the world (Swati, Ekele, Shehu & Ikechukwu, 2014). Preeclampsia affects about 3% of pregnancies in the United States (Lo, Mission & Caughey, 2013). Pre-eclampsia and eclampsia seizure rate of up to 20.8% was reported in West Africa (Tebau, Halle, Ngowa, Domgue, Ourtching & Mboudou, 2017). In Nigeria, it is estimated that 5-10% of pregnancies are complicated by hypertensive disorders in pregnancy (Swati, *et al.*, 2014). Eclampsia is the second leading cause of maternal death in Nigeria, it accounts for 18.6% maternal mortality rate (Ezugwu, Agu, Nwoke & Ezugwu, 2014). In Northern Nigeria, the incidence of eclampsia was 9.42% in Birnin kudu, Jigawa State, 1.02% in Kano, and 7.6 per one thousand deliveries in Abuja (Esike *et al.*, 2017). It is the third commonest cause of maternal mortality in Nigeria (Agida, *et al.*, 2018).

The researcher observed that women with pre-eclampsia and eclampsia develop life threatening complications like; Acute renal failure, Hemolysis Elevated Liver enzyme and Low Platelets count syndrome, Respiratory distress syndrome and Abruptio placentae and the fetuses; Birth asphyxia, Preterm birth, Intrauterine growth restriction and Intrauterine fetal demise among others. It was also observed that there is high chance of reoccurrence of pre-eclampsia and

eclampsia in a woman who has had it before or in a family with history of pre-eclampsia and eclampsia regarding the risk factors of the condition.

There is no known study in Bauchi state regarding nurses and midwives' knowledge, skills on management, availability of resources for the management and barriers faced by the staffs while providing the management on pre-eclampsia and eclampsia patients. Furthermore, the researcher feels that the cost of treatment of pre-eclampsia and eclampsia is very high in Nigeria; this is because government is not supplying the drug in the hospitals as required. Thus, it requires patient relations to purchase the drug for use from outside the hospital before the loading dose of Magnesium sulphate is administered to the patient; this implies that cost effectiveness of MgSO<sub>4</sub> intervention is high in Bauchi state. Despite the care rendered by the health professionals there is still high maternal and perinatal morbidity and mortality in Bauchi state. Hence, the study is to assess eclampsia management among nurses and midwives in secondary health care facilities in Bauchi State.

## **1.2 Significance of the Study**

The result of this study will be of benefit in the following ways;

The result will motivate nurses and midwives to provide effective management to the patients by utilizing the available resources in delivering high quality care through the intervention of management/policy makers tackling the challenges pointed out by the study. Findings of this study will acquaint the respondents with knowledge when the researcher disseminates the information through workshop to enhance the services provided to the patients in by initiating their skills so as to reduce adverse outcome thereby contributing to the decrease in maternal morbidity and mortality in the state. It will also encourage the Government /management in

strengthening the capacity building of the system by organizing workshops and training to improve the knowledge of the nurses and midwives from fair to good in management of pre-eclampsia and eclampsia patients. It will also be of benefit to Nursing and Midwifery Council in upgrading student curriculum to receive adequate knowledge and proper training in school so as to avoid further bad outcome in management of the condition. Findings of this study will serve as a reference to the government/policy makers and development partners in their procurement, implementation of the management of pre-eclampsia and eclampsia and supply of the necessary resources. It will also serve as a resource material for other researchers.

### **1.3 Aim and Objectives of the Study**

#### **1.3.1 Aim**

The aim; is to assess eclampsia management among nurses and midwives in secondary health care facilities in Bauchi State.

#### **1.3.2 Objectives**

1. To determine the knowledge in management of pre-eclampsia and eclampsia among nurses and midwives in secondary health facilities in Bauchi State.
2. To assess the skills of nurses and midwives in management of pre-eclampsia and eclampsia in secondary health facilities in Bauchi State.
3. To assess the availability of resources for management of pre-eclampsia and eclampsia by nurses and midwives in secondary health facilities in Bauchi State.
4. To identify challenges faced by nurses and midwives in providing the management to pre-eclampsia and eclampsia patients in secondary health facilities in Bauchi State.

### **1.4 RESEARCH QUESTIONS**

1. What is the knowledge in management of pre-eclampsia and eclampsia among nurses and midwives?
2. What is the skill of nurses and midwives in pre-eclampsia and eclampsia management?
3. Are the resources for management of pre-eclampsia and eclampsia available?
4. What are the challenges faced by nurses and midwives in providing management to pre-eclampsia and eclampsia patients in health care facilities in Bauchi State?

### **1.5 SCOPE OF THE STUDY**

The study covers assessment of pre-eclampsia and eclampsia management among nurses and midwives in maternity units of secondary health care facilities in Bauchi state. The researcher spent twelve months to cover the study.

## **CHAPTER TWO**

### **2.0 REVIEW OF RELATED LITERATURE**

This study focuses on assessment of the pre-eclampsia and eclampsia management in relation to the nurses and midwives' knowledge, skills, availability of resources and challenges faced by staffs in providing effective management to the patients in secondary health care facilities in Bauchi State. Related literatures in the management of pre-eclampsia and eclampsia patient were reviewed and organized as follows;

1. Concept of pre-eclampsia and eclampsia
2. Management of Pre-eclampsia and Eclampsia`
3. Empirical study
4. Theoretical framework

### **2.1 Concept of Pre-eclampsia and eclampsia**

#### **2.1.1 Definitions**

Eclampsia is a neurologic condition associated with pre-eclampsia, manifesting with tonic-clonic convulsions in pregnancy that cannot be attributed to other conditions such as epilepsy (Marshall &Raynor, 2016).

Eclampsia, which is considered a complication of severe pre-eclampsia, is commonly defined as new onset of grand mal seizure activity and/or unexplained coma during pregnancy or postpartum in a woman with signs or symptoms of pre-eclampsia (Warrington, 2015). It typically occurs during or after the 20th week of gestation or in the postpartum period.

Nonetheless, eclampsia in the absence of hypertension with proteinuria has been demonstrated to occur in 38% of cases reported in the United Kingdom (Ross, 2016). Similarly, hypertension was absent in 16% of cases reviewed in the United States (Ross, 2016).

It is estimated that every year eclampsia is associated with about 50 000 maternal deaths worldwide, most of which occur in developing countries (Kidanto, Wangwe, Massawe, Lindmark & Nyström, 2012). Nigeria accounts for about 14% of these (Kabo, Otolorin, Williams, Orobato, Abdullahi, Sadauki, & Abdulkarim, 2016). The maternal mortality ratio for Nigeria is 576 deaths per 100,000 live births. The 95% confidence interval for the 2013 MMR ranges from 500-652 deaths per 100,000 live births (Nigeria Demographic Health Survey, 2013). It probably occurred due to pregnant women's lack of easy access to appropriate antenatal care in those settings. Even in countries with low maternal mortality, a substantial proportion of the maternal deaths will be attributed to pre-eclampsia and eclampsia. In the United Kingdom, pre-eclampsia and eclampsia account for 15% of the direct maternal deaths and two-thirds are related to pre-eclampsia (Kidanto, *et al.*, 2012). The maternal Mortality Ratio in Bauchi State as of 2010-2015 rose from 1350/100,000 live births to 1380/100, 000 live births (Bauchi State Strategic Health Development Plan, 2015).

Every year it is estimated that worldwide, more than 500 000 women die of complications of pregnancy and child birth. At least 7 million women who survive childbirth suffer serious health problems and further 50 million women suffer adverse health consequences after childbirth, the overwhelming majority of these deaths and complications occur in developing countries (WHO, 2008). The majority of deaths due to pre-eclampsia and eclampsia are avoidable through the provision of timely and effective care to the women presenting with these complications (WHO, 2011).

United States Agency for International development (USAID) (2016) reported that pre-eclampsia and eclampsia need effective and timely treatment, it is essential that certain equipment and commodities are available at facilities. Magnesium sulphate was found in four secondary facilities, these facilities reported its regular use, while seven reported occasional use. Calcium gluconate for managing magnesium sulphate toxicity was found in only one secondary facility.

### **2.1.2 Epidemiology of pre-eclampsia and eclampsia**

Pre-eclampsia affects 5-9% of all pregnancies worldwide (World Health Organization (WHO), 2005), with onset of symptoms in the second or third trimester, most commonly after the thirty second week. Some women will experience pre-eclampsia as early as late first trimester or early second trimester, though this is rare. It is much more common in women who are pregnant for the first time, and its frequency drops significantly in subsequent pregnancies (Omboga, 2010).

Pre-eclampsia is also more common in women who have preexisting hypertension, diabetes, autoimmune disease such as lupus, and various inherited thrombophilia's such as factor V Leiden, renal disease, women with a family history of pre-eclampsia, obese women and women with multiple gestations. The single most significant risk for developing pre-eclampsia is having had pre-eclampsia in a previous pregnancy (Omboga, 2010). Pre-eclampsia may also occur in the immediate postpartum period, the most common period being 24-48 hours postpartum and careful attention should be given to pre-eclampsia signs and symptoms within the period (Omboga, 2010).

The clinical manifestations of maternal pre-eclampsia are hypertension and proteinuria with or without coexisting systemic abnormalities involving the kidneys, liver, or blood. There is also a fetal manifestation of pre-eclampsia involving fetal growth restriction, reduced amniotic fluid,

and abnormal fetal oxygenation (Ross, 2016). Hemolysis Elevated Liver enzymes and Low Platelets count (HELLP) syndrome is a severe form of preeclampsia and involves hemolytic anemia, elevated liver enzymes and low platelet count.

Most cases of eclampsia present in the third trimester of pregnancy, with about 80% of eclampsia seizures occurring intrapartum or within the first 48 hours postpartum (Ross, 2016). Rare cases have been reported before 20 weeks' gestation or as late as 23 days postpartum. Other than early detection of pre-eclampsia, no reliable test or symptom complex predicts the development of eclampsia. In developed countries, many reported cases have been classified as unpreventable (Ross, 2016).

Eclampsia manifests as one seizure or more, with each seizure generally lasting 60-75 seconds. The patient's face initially may become distorted, with protrusion of the eyes, and foaming at the mouth may occur. Respiration ceases for the duration of the seizure (Ross, 2016). It seizures may be divided into 2 phases. Phase 1 lasts 15-20 seconds and begins with facial twitching. The body becomes rigid, leading to generalized muscular contractions, while phase 2 last for about 60 seconds (Ross, 2016).

Eclampsia, the major neurological complication of pre-eclampsia, is defined as a convulsive episode or any other sign of altered consciousness arising in a setting of pre-eclampsia, and which cannot be attributed to a pre-existing neurological condition. Clinical examination should include resting blood pressure measurement using an appropriate cuff, and screening for weight gain, edema (including signs of acute pulmonary edema and cerebral edema), cardiomyopathy, and acute renal failure. The fetus should be assessed by electrocardiography. Other examinations include fetal ultrasound with Doppler velocimetry of the umbilical, cerebral, and

uterine arteries, estimation of fetal weight, assessment of fetal well-being by Manning score, and examination of the placenta (Uzan, Carbonnel, Piconne, Asmar & Ayoubi, 2011).

Study carried out at Abakaliki South-East, Nigeria on the fetomaternal outcome of pre-eclampsia with severe features of eclampsia revealed that the incidence of pre-eclampsia and eclampsia varies from one part of the world to another (Ajah, *et al.*, 2016). The fetal complications of preeclampsia with severe features and eclampsia comprise placental abruption, intrauterine growth restriction, premature delivery and intrauterine fetal death. More so, the maternal complications of preeclampsia with severe features and eclampsia consist of HELLP syndrome, Disseminated Intravascular Coagulation (DIC), acute kidney injury, cerebrovascular hemorrhage, cortical blindness, focal motor deficit and adult respiratory distress syndrome.

A study carried out by Omboga (2010) at Garissa provincial general hospital Kenya revealed substantial reduction of deaths due to pre-eclampsia and eclampsia from 11.9/ million to 7/million when standardized guidelines are used. Of these deaths, nine women died from cerebral causes with substandard care in 50% of cases.

A study conducted at Brazil shows that eclampsia is a rare, however potentially life-threatening complication of the hypertensive disorders of pregnancy, accountable for large numbers in morbidity and deaths among women of reproductive age and their offspring (Giordano, Parpinelli, Jose, Haddad, Coster, Surita, & Joao, 2014).

A study by Ugwu, Dim, Okonkwo & Nwankwo (2012) on the effectiveness of using magnesium sulphate in Enugu, Nigeria that the management of severe pre-eclampsia and eclampsia involves the use of drugs in the control of blood pressure and seizure prophylaxis, the latter employs drugs such as diazepam, phenytoin, and magnesium sulfate (MgSO<sub>4</sub>). Emerging evidence

suggests that MgSO<sub>4</sub> is superior to other anticonvulsants in the management of severe pre-eclampsia and eclampsia. In line with this, there has been increasing use of MgSO<sub>4</sub> in health institutions in Nigeria. From the year 2007, the use of intramuscular MgSO<sub>4</sub> regimen replaced diazepam in the protocol for the management of pre-eclampsia and eclampsia at the University of Nigeria Teaching Hospital (UNTH), Enugu, Nigeria.

### **2.1.3Aetiology**

There is no definitive known cause of pre-eclampsia, though it is likely related to a number of factors (Al-jameil, Khan, &Tabassum, 2014), (Bilano, Ota, Ganchimeg, Mori & Souza, 2014). Since pre-eclampsia's etiology remains unknown. According to Uzan,*et al.*, (2011), eclampsia is characterized by suboptimal uteroplacental perfusion associated with a maternal inflammatory response and maternal vascular endothelial dysfunction. This in turn leads to vascular hyper permeability, thrombophilia and hypertension, which may compensate for the reduced flow in the uterine arteries. As for pre-eclampsia's adverse maternal and perinatal outcomes, there is limited information and research assessing the magnitude of risks in low-resource areas where the impact is thought to be more severe (Duley, 2009). Furthermore, small sample sizes or lack of adjustment for some important confounders are notable weaknesses that have restricted previous research.

Genetic predisposition, immunology, endocrinology, nutrition, abnormal trophoblastic invasion, coagulation abnormalities, vascular endothelial damage, cardiovascular maladaptation, dietary deficiencies or excess, and infection have been proposed as etiologic factors for pre-eclampsia and eclampsia (Gabbe, 2007). Imbalanced prostanoid production and increased plasma ant phospholipids have also been implicated in eclampsia (Warrington, 2015). In Murine models,

placental ischemia appears to be associated with an increased susceptibility to seizures and cerebrospinal fluid inflammation (Warrington, 2015).

#### **2.1.4 Risk factors of pre-eclampsia and eclampsia**

The mechanisms responsible for the development of pre-eclampsia or eclampsia is still unknown (Warrington, 2015). The following are considered risk factors for eclampsia: Nulliparity, Family history of pre-eclampsia, previous preeclampsia and eclampsia, Poor outcome of previous pregnancy, including intrauterine growth retardation, abruptio placentae, or fetal death, multifetal gestations, hydatidiform mole, fetal hydrops, primigravida, teen pregnancy, patient older than 35 years and lower socioeconomic status (Gabbe, Niebyl, Simpson, London, Galan, Jauniaux & Grobman, 2016). Other medical conditions also considered risk factors include; Obesity, Chronic hypertension, renal disease. Thrombophilia, ant phospholipid antibody syndrome, Protein C deficiency and protein S deficiency, Antithrombin deficiency, Vascular and connective tissue disorders, Gestational diabetes and Systemic lupus erythematosus (Ross, 2016).

#### **2.1.5 Diagnostic Procedure for pre-eclampsia and eclampsia**

Factors leading to maternal mortality or severe morbidity are diverse and variable, a deficit in the knowledge of registered midwives about pre-eclampsia and eclampsia during pregnancies, including its assessment, diagnosis and management, could result in problems such as misdiagnosis and delayed referrals. This could contribute to high maternal and infant morbidity and mortality rates (Stellenberg & Ngwekazi, 2016).

The diagnosis of pre-eclampsia can be particularly challenging in women with pre-existing hypertension and/or renal disease since both blood pressure and urinary protein excretion

increase towards the end of pregnancy. Thus, the diagnosis is made based on a sudden increase in blood pressure or proteinuria and/or evidence of end-organ damage (Jeyabalan, 2014).

Eclampsia is diagnosed when a woman with preeclampsia has seizures. These seizures usually happen in women who have severe preeclampsia, though they can occur with pre-eclampsia. Eclampsia also can happen soon after a woman gives birth. Approximately 30% to 50% of patients with eclampsia also have the HELLP syndrome (Pre-eclampsia and Eclampsia, 2016). Ross (2016), suggest the following diagnoses; Seizures in the first trimester or well into the postpartum period probably are due to central nervous system pathology and warrant full evaluation, these includes;

Computed tomography (CT) scanning of the head, lumbar puncture (if clinical evidence of meningitis or concern for hemorrhage exists), determination of electrolyte levels, and urine or serum toxicologic screening. In addition, rule out hypoglycemia as cause of seizure or result of seizure, and rule out hyperglycemia as cause of mental status (Rose, 2016). In diagnosing pregnant mothers in the pre-eclampsia stage, a triad of signs and symptoms are observed: Intense Vasospasm, Local or disseminated intravascular, coagulation and Plasma volume contraction (Hope, 2012).

Clinical and laboratory tests are intended to define and determine the severity of pre-eclampsia. Headaches, tinnitus, phosphine signals, visual disorders, brisk tendon reflexes, and vigilance disorders are related to cerebral edema; oliguria to acute renal failure; uterine contraction, vaginal bleeding to placental abruption; vomiting to HELLP syndrome; band-like epigastric pain to sub capsular hepatic hematoma; and dyspnea to cardiac failure (Uzan, *et al.*, 2011). No single laboratory test or set of laboratory determinations is useful in predicting maternal or neonatal

outcome in women with eclampsia. These investigations include the following, especially if there is doubt about the diagnosis or possible injuries secondary to seizure activity (Ross, 2016). Urinalysis and uric acid levels, hematological studies, serum creatinine level, liver function test, computerized tomography scanning and magnetic resonance imaging of the head, electroencephalography and cerebrospinal fluid studies. Eclampsia remains a significant life-threatening complication of pregnancy, and magnesium sulfate ( $MgSO_4$ ) is the primary drug in treatment of women with pre-eclampsia for prevention of eclampsia (Cipolla & Kraig, 2011). It is contraindicated to patients with Myasthenia gravis and impaired renal function (Anonymous, 2016).

## **2.1.6 Management of Pre-eclampsia and Eclampsia**

Management of pre-eclampsia and eclampsia includes two aspects, viz; medical management which involve the use of drugs and secondly, nursing management that includes all the care provided to pre-eclampsia and eclampsia patients.

### **2.1.6.1 Medical Management**

Magnesium Sulphate Regimen: ( $MgSO_4$ ) is generally administered parenterally in a loading dose (Intravenous (IV) with or without additional Intramuscular (IM) dosing) followed by maintenance dosing (by continuous IV infusion or intermittent IM injections). The two most commonly used regimens are the Zuspan regimen (a loading dose of 4g IV, and maintenance dosing of 1 g/hour IV) and the Pritchard regimen (loading doses of 4 g IV and 10 g IM, and maintenance dosing of 5 g IM/4hr) (Gordon, Magee, Payne, Firoz, Sawchuck, Tu & von Dadeszen, 2014).

### **2.1.6.1.1 Pritchard Regimen**

The loading dose: Initially; 4 gm of 20% MgSO<sub>4</sub> IV over not less than 3 minutes (Anonymous, 2016). Take one 20 ml syringe, Draw 4 ampoules of Magnesium sulfate, Add 12 ml Normal saline, immediately followed by: 10 gm of 50% MgSO<sub>4</sub> IM (5 gm in each buttock) Take two 10 ml syringes, Draw 5 ampoules of MgSO<sub>4</sub> in each syringe, Add 1 ml of 2% Lignocaine in each syringe, Give deep IM in each buttocks. If convulsion persists after 15 minutes, give 2 gm of 50% MgSO<sub>4</sub> IV bolus over 5 minutes. Maintenance dose: 5 gm of 50% MgSO<sub>4</sub> IM 4 hourly in alternate buttocks; Take one 10 ml syringe, Draw 5 ampoules of MgSO<sub>4</sub>, Add 1 ml of 2% Lignocaine in each syringe, Give deep IM 4 hourly in alternate buttocks, Continue for 24 hours after the last convulsion or delivery (Anonymous, 2016).

### **2.1.6.1.2 Zuspan Regimen**

Zuspan regimen is a treatment regimen using Magnesium sulphate for the treatment of eclampsia. Magnesium sulphate 4g is given as IV bolus dose in the beginning, followed by intravenous infusion of Magnesium sulphate at the rate of 1g/hour till 24 hours have elapsed after the last seizure (Francis, 2018).

### **2.1.6.1.3 VIMS and Sibai Regimen**

It is also called Single dose regimen. Single doses of 4g diluted 50% Mgso<sub>4</sub> intravenously, with simultaneous 4g 50% MgSo<sub>4</sub> intramuscularly (Anonymous, 2016). Sibai regimen is an intravenous magnesium sulphate for treatment of eclampsia, loading dose of 6g IV given over 20 minutes and maintenance dose 2-3g IV every hour (Francis, 2018). Suspend or postpone use of Magnesium sulfate if any of the following is present; Respiratory rate < 16/min (Respiratory

depression), Urine output < 30 ml/hour in preceding 4 hours (Impaired renal function), absent patellar reflex (Muscle paresis) (Anonymous, 2016).

#### **2.1.6.1.4 Management of Magnesium Sulphate Toxicity**

If urine output < 30 ml/hour: The management include the following;MgSO<sub>4</sub> withheld, IV ringer lactate infusion 1 liter over 8 hours, Monitor for pulmonary edema. The management of respiratory depression include:Perform assisted ventilation, Antidote: Calcium gluconate 1 gm (10% of 10 ml) IV slowly over 10 minutes (Anonymous, 2016).

#### **2.1.6.1.5 Antihypertensive medication**

For systolic blood pressure  $\geq$  160 or diastolic blood pressure  $\geq$  110; Labetalol; initial dose: 20mg. hydralazine; 5-10mg IV over 2 min. oral Nifedipine 10 mg capsules; it should be administered orally or otherwise administered sublingually (American College of Obstetricians and Gynecologists (ACOG), 2017).

#### **2.1.6.1.6 Anticonvulsant Medication**

For recurrent seizures; lorazepam: 2-4 mg IV may be repeated after 10-15 min. Diazepam: 5-10 mg IV over 5-10 min. Phenytoin: 15-20 mg/kg IV, 10 mg/kg to be repeated (ACOG, 2017).

#### **2.1.6.2 Nursing Management**

Management of pre-eclampsia and eclampsia involves a multidisplinary action of nurses and midwives, obstetrician and hematology unit. Women at risk of pre-eclampsia should be investigated for underlying medical problems and will normally be commenced on aspirin from

twelve weeks gestation until the baby is born (Marshall & Raynor, 2016). Pre-eclampsia can be recognized by the following nursing diagnosis;

Blood pressure: Systolic  $>140$  mmHg or diastolic  $>90$  mmHg (mild hypertension), moderate hypertension; systolic  $>150$  mmHg or diastolic  $>100$  mmHg and severe hypertension with systolic  $>160$  mmHg or diastolic  $>110$  mmHg. Proteinuria: A mid-stream urine specimen may be necessary to exclude urinary tract infection as a cause of proteinuria, for dipstick test, ensure the reagent are in date and read according to the stipulated label. Significant proteinuria is diagnosed when the urinary protein: creatinine ratio is  $>30$  mg/mmol, or if a 24-hour urine collection result is  $>300$  mg protein (Marshall & Raynor, 2016). Edema may be detectable on examination especially the ankle edema, generalized edema that pits on pressure on the pre-tibial surface, face, hands, abdomen and sacrum especially in sudden onset. (Marshall & Raynor, 2016).

Laboratory investigations includes the following; Urine sample or 24-hour urine collection to quantify the proteinuria ( $>300$ mg), determine the ratio of protein to creatinine ( $>30$  mg/mmol). Full blood count, Urea and electrolytes, liver enzymes to assess liver function and assessment of fetal wellbeing by ultrasound (Marshall & Raynor, 2016).

Management of pre-eclampsia and eclampsia patients in pregnancy, labour and post-natal include the following; Ensure side rails up, Ensure patent airway, put patient in lateral position, monitor blood pressure, maternal vital signs to be monitored, Administer supplemental oxygen, Maintain input and output, suction available, Fetal heart rate monitoring, administer magnesium sulphate for convulsion, administer antihypertensive if appropriate, maintain IV infusion, Reassure the family. If preterm ( $<34$  weeks), administer corticosteroids. (ACOG, 2017). Baby Nurses and midwives may facilitate the birth of the baby in the absence of obstetric complications. There

should be continuous fetal monitoring continue administering antihypertensive drugs and blood tests according to previous results and clinical presentation. Oxytocin is used to control hemorrhage during third stage of labour. Blood pressure should be measured hourly, maintain intake and output. There should be regular measurement of BP, it should be measured four times a day. Discontinued methyldopa or should be replaced if the BP is  $\geq 150/100$  mmHg (Marshall & Raynor, 2016).

#### **2.1.6.2.1 Skills Required in Management of Pre-eclampsia and Eclampsia Patients**

It also falls in line with the World Health Organization (2007) definition of nurses and midwives as skilled birth attendants; A skilled birth attendant is a health professional such as a midwife or doctor who has been educated and trained to proficiency in the skills needed to manage normal pregnancies, child birth and the post-natal period; and the identification, management and referral of complications in women and children (WHO, 2007).

Tukur, Ishaku, Ahonsi, Oginni & Adoyi (2016) conducted a study on training of nurses and midwives in Nigeria, the result show only over half (57.2%) of the tutors could define pre-eclampsia before the training, this rose to 88.9% after the training. Similarly, only 62.7% knew of the symptoms and signs of severe Pre-eclampsia and eclampsia before the training as compared with 90.1% after the training. Knowledge on use of appropriate vasodilators for severe hypertension rose to 79.3% from a baseline of 36.6%, and while only 46.9% of the subjects could describe hypertensive disease in pregnancy at baseline, the percentage rose to 70.3% after the training. In the same vein, only 22.3% and 16.8%, respectively, knew the maintenance dose of  $MgSO_4$  for treating severe P/E and Calcium gluconate as an antidote for  $MgSO_4$  toxicity. These rose to 76.3% and 82.6%, respectively, after the training.

Ekele (2009) suggested on the study conducted by USAID (2016) on the systematic review on management of pre-eclampsia and eclampsia in Nigeria, despite the abundance of evidence demonstrating the safety and effectiveness of MgSO<sub>4</sub>, its use has remained low. Low availability of MgSO<sub>4</sub>, misinformation regarding who can administer the drug, poor knowledge of health workers on its use, fear of toxicity, readily available of pre-packaged forms of less effective drugs (like diazepam), and lack of support for policy change all contribute to the underutilization of this safe and effective life-saving drug. Even if providers are trained to use MgSO<sub>4</sub> and know how and when to use it, sometimes providers choose to use diazepam instead because they are more familiar with it since it was the recommended drug for pre-eclampsia and eclampsia in Nigeria for decades before MgSO<sub>4</sub> was introduced (USAID, 2015).

Technologies for Health and Consultative Meeting (2012) Reducing morbidity and mortality from pre-eclampsia and eclampsia requires primary prevention, and where that fails, timely identification and access to the treatment package for severe preeclampsia. Additionally, although most cases of eclampsia present in the third trimester of pregnancy, with about 80 percent of eclampsia seizures occurring intrapartum or within the first 48 hours following delivery, WHO (2011) reported that only around 50 percent of deliveries were attended by skilled birth attendants in the WHO Africa Region and the WHO South-East Asia Region, making it impossible to treat seizures when they occurred (WHO, 2011).

Treatment of eclampsia follows well-defined guidelines aiming at preventing low oxygen to mothers, controlling maternal blood pressure, preventing ongoing seizures and preparing to deliver the baby by the safest method possible (Sibai, 2013). Supportive care for eclampsia include close monitoring, air way support, adequate oxygenation, anticonvulsant therapy and blood pressure control (Sibai, 2013). Correct positioning of the patients decrease the risk of

aspiration and helps to improve uterine blood flow by relieving obstruction of venacava by gravid uterus, protecting the patient against injury during the seizures, using a padded tongue blade between the teeth and suctioning the oral secretions as needed (Nahar, Laila, Akhtar, Shamsunnahar, Khatun & Chowdhury, 2013).

For women with confirmed pre-eclampsia a two - dose course of corticosteroid (betamethasone 11.4 mg with a repeat dose of betamethasone 11.4 mg after 24 hours) should be administered if delivery is likely to be necessary between 24 and 34 weeks' gestation. If the woman remains undelivered more than 7 days after administration of the first course of steroids consideration should be given to repeating a single injection of betamethasone (11.4mg) at weekly intervals until 32 completed weeks. Further consideration should also be given to corticosteroids if elective caesarean delivery is planned between 34 and 38 weeks (Hypertension-Antenatal-Intra-and-postpartum, 2017).

The primary goal of the WHO Recommendations for Prevention and Treatment of Pre-eclampsia and eclampsia is to improve the quality of care and outcomes for pregnant women who develop the two most dangerous hypertensive disorders. While the recommendations are not intended to be comprehensive, they are intended to promote proven, evidence-based clinical practices in the management of women with pre-eclampsia and eclampsia (WHO, 2011).

World Health Organization recommends magnesium sulfate as the most effective, safe, and low-cost anticonvulsant treatment for severe pre-eclampsia and eclampsia. Several national health protocols recommend its use. But in practice, the drug often is not available at secondary levels or may not be used in accordance with guidelines (WHO, 2007). Effective care includes

identification and referral of women at high risk, prompt diagnosis with prevention and treatment of complications, and timely delivery as the only definitive cure (Duley, Meher & Abalos, 2006).

Current American College of Obstetricians and Gynecologists recommendations regarding the use of low-dose aspirin for the prevention of pre-eclampsia are based on the cumulative efforts of the Task Force on Hypertension in Pregnancy; the Task Force report was issued by ACOG in November 2013 (American College of Obstetricians and Gynecologists, 2016). That report was based on an extensive review of the available evidence at that time. In that report, the use of low-dose aspirin, beginning in the late first trimester, was suggested for women with a history of early-onset pre-eclampsia and preterm delivery at less than 34 0/7 weeks of gestation, or in women with more than one prior pregnancy complicated by preeclampsia (ACOG, 2016).

Nearly one-tenth of maternal deaths in Asia and Africa and one-quarter of maternal deaths in Latin America are associated with hypertensive disorders of pregnancy. Among the hypertensive disorders, pre-eclampsia and eclampsia have the greatest impact on maternal and newborn morbidity and mortality. Yet the majority of deaths related to pre-eclampsia and eclampsia could be avoided if women received timely and effective care, delivered according to evidence-based standards (WHO, 2011).

### **2.1.6.3 Resources in Management of Pre-eclampsia and Eclampsia Patients**

Kidanto, *et al.*, (2012) reported that about 50,000 maternal deaths occur yearly due to eclampsia, the majority in countries with limited resources and low standard of health care (Kidanto, *et al.*, 2012).

Effective care includes identification and referral of women at high risk, prompt diagnosis with prevention and treatment of complications, and timely delivery (the only definitive cure) (Duley, Meher&Abalos, 2006). Traditionally, women with either proteinuric or non-proteinuric hypertension were admitted to hospital for assessment and treatment. In many developed countries this process now takes place in day care units (Duley, Meher&Abalos, 2006).

### **2.1.6.3.1 Human Resources**

One of the challenges facing developing countries, particularly in Africa, in achieving the Sustainable Development Goals (SDGs) is the availability of health human resources. Not only do these countries have a shortage of human resources, but their distribution is often uneven, especially between urban and rural areas (Ly, Kouanda&Ridde, 2014).

Human Resources for Health (HRH) comprise of trained health personnel in the public and private sector (doctors, nurses/midwives, pharmacists, relevant technicians, public health officers, community health workers, etc.), untrained informal health workers including communitybased health care providers e.g. herbalists, traditional birth attendants, and volunteers, who play complementary roles in health care delivery (Bauch State Strategic Health Development Plan (BASSHDP), 2010-2015).

There shall be no averaging of the number of patients and the total number of licensed nurses on the unit during any one shift or over any period of time. Only licensed nurses providing direct patient care shall be included in the ratios (Nursing Service Staff, 2003). The licensed nurse-to-patient ratio in a labor and delivery suite of the perinatal service shall be 1:2 or fewer active labor patients at all times. When a licensed nurse is caring for antepartum patients who are not in

active labor, the licensed nurse-to-patient ratio shall be 1:4 or fewer at all times (Nursing Service Staff, 2003).

The licensed nurse-to-patient ratio in a postpartum area of the perinatal service shall be 1:4 mother-baby couplets or fewer at all times. In the event of multiple births, the total number of mothers plus infants assigned to a single licensed nurse shall never exceed eight. For postpartum areas in which the licensed nurse's assignment consists of mothers only, the licensed nurse-to-patient ratio shall be 1:6 or fewer at all times. The licensed nurse-to-patient ratio in a postpartum area of the perinatal service shall be 1:4 mother-baby couplets or fewer at all times. In the event of multiple births, the total number of mothers plus infants assigned to a single licensed nurse shall never exceed eight. For postpartum areas in which the licensed nurse's assignment consists of mothers only, the licensed nurse-to-patient ratio shall be 1:6 or fewer at all times. The licensed nurse-to-patient ratio in a combined Labor/Delivery/Postpartum area of the perinatal service shall be 1:3 or fewer at all times the licensed nurse is caring for a patient combination of one woman in active labor and a postpartum mother and infant (Nursing Staff Service, 2003).

According to Australians nurse/patients ratio; Two midwives: three delivery suites on each shift. While for ante/post-natal Midwife: patient ratio am - 1:4 plus one in-charge nurse, pm - 1:4 plus one in-charge nurse and on night duty - 1:6. Staff/patients ratio depends on the situation and patients flow (Victorian Nurse/Midwife Patient Ratios, 2015).

In 2004, California enacted a nurse-to-patient ratio law. To this day, California is the only state with a nurse-to-patient ratio law. The intent of the law was to improve care for patients and although no consensus has yet been reached, studies have shown that the law has improved patient care in a variety of domains (Leigh, 2015).

### **2.1.6.3.2 Physical Facilities and Infrastructure**

An estimated 7.6 million infants die in the perinatal period each year, and more than 500 000 women die during pregnancy or childbirth, of which 99% are in developing countries (WHO, 2008). While maternal and child health has remained a chief concern for policy-makers worldwide, little is known about the role of poor-quality, unsafe care (WHO, 2008). High maternal and infant mortality rates can be attributed mainly to lack of access to medical facilities and inadequate care. Access to care should be addressed by capacity-building, improved transport and increased numbers of health facilities and health-care providers (WHO, 2008).

### **2.1.6.3.3 Equipment and Consumables**

World Health Organization (WHO) experts have determined that although the auscultatory technique has remained essentially unchanged for over a century, this technique can be inaccurate due to a faulty application of the method and poor distinction of the different Korotkoff sound phases. In particular, the estimation of diastolic blood pressure using the auscultatory technique is limited in accuracy (WHO, 2012), and subject to observer error such as digit preference and observer bias (Villar, Say, Shennan, Lindleimer, & Duley, 2004). Furthermore, concerns about the toxicity of mercury for the users and the environment have added to the body of evidence that traditional devices are inappropriate for low-resource settings. Some countries have banned the use of mercury devices. There is a need for accurate and affordable BP measurement technologies.

In low-resource settings, protein dipsticks are often used at the point of care. This is because implementing the gold standard of protein measurement (urine collection over 24 hours and analysis using a manual or automated methods) is not practical in such a setting. Common dipsticks typically detect albumin through a reaction with a blue dye. However, their correlation

with 24-hour test results can vary. More advanced dipsticks measure the ratio of protein to creatinine which can correlate more closely to 24-hour tests. Dipsticks can be assessed against a standard color or fed into an automated reader. Automated readers help standardize dipstick results.

#### **2.1.6.3.4 Drugs**

Eclampsia convulsions are life-threatening emergencies and require the proper treatment to decrease maternal morbidity and mortality. Delivery is the only definitive treatment for eclampsia (Ross, 2016). The drug of choice to treat and prevent eclampsia is magnesium sulfate

Although the definitive treatment of pre-eclampsia and eclampsia is delivery, control of convulsions is the first and foremost principle of management of eclampsia. Magnesium sulphate ( $MgSO_4$ ) is the anticonvulsant of choice as it controls and prevents recurrence of eclamptic convulsions more effectively than diazepam and phenytoin, in addition to reducing fetomaternal morbidity and mortality (Nagaria, Mitra & Banjare, 2017).

Different magnesium sulfate regimens have been tested, two dosing regimens are internationally recommended and widely used (Pratt, Niedle, Vogel, Oladapo, Bohren, Tunçalp & Gülmezoglu, 2015). The Pritchard regimen is a predominantly intramuscular (IM) regimen given as a loading dose of 4 g intravenously (IV) and 5 g IM into each buttock followed by a maintenance dose of 5 g IM every 4 h. However, it is associated with pain and a higher risk of infection at the injection site. The Zuspan regimen, which is given as a 4-g IV loading dose followed by continuous IV infusion of 1 g/hour, is more commonly used in high-income countries (Pratt, *et. al.*, 2015).

Magnesium sulphates in form of IV (Intra Venous) is the initial drug administered to terminate seizures. Seizures usually terminate after the loading dose of magnesium. A loading dose of 4-6 g (15-20 min) and a maintenance dose of 1-2 g per hour as a continuous IV solution should be administered. Alternatively, lorazepam (Ativan; 4 mg IV over 2-5 minutes) or diazepam (Valium; 5-10 mg IV slowly) can be used to terminate the seizure, after which magnesium sulfate is administered. Note: Magnesium toxicity can cause coma, and changes in mental status (Gabbe, 2007). Benzodiazepines or phenytoin can be used for seizures that are not responsive to magnesium sulfate (Ross, 2016). Globally, the currently recommended dosing regimens are faced with implementation challenges for a number of reasons: cost, availability, complexity of administration, need for clinical and or laboratory monitoring, risk of toxicity and the need for an antidote and services to deal with overdose or other complications (Pratt, *et al.*, 2015).

According to Committee Opinion (2016), familiarity with second-line medications phenytoin and diazepam/lorazepam is required for cases in which magnesium sulfate may be contraindicated (e.g., myasthenia gravis) or ineffective. Control of hypertension is essential to prevent further morbidity or possible mortality. The most commonly used antihypertensive agents are hydralazine, labetalol, and Nifedipine (Ross, 2016). Diuretics are used only in the setting of pulmonary edema. Care must be taken not to decrease the BP too drastically; an excessive decrease can cause inadequate uteroplacental perfusion and fetal compromise (Lucas, Leveno & Cunningham 1995). BP should be assessed with the goal of maintaining the diastolic BP at less than 110 mm Hg with administration of antihypertensive medications as needed (eg, hydralazine, labetalol, nifedipine) (Ross, 2016)

Barrs and Repke (2016) suggest that avoiding nonsteroidal anti-inflammatory drugs (NSAIDs) for pain relief may help control persistent hypertension, as these drugs may increase blood

pressure and adversely affect kidney function. Blood pressure that continues to be elevated beyond 12 weeks after delivery is unlikely to be related to preeclampsia and may require long-term treatment (Barrs&Repke, 2016). California Pregnancy Associated Mortality Review (2011), states that Magnesium sulfate is used to prevent eclampsia seizures in women with preeclampsia at highest risk for them. When eclampsia seizures occur, magnesium sulfate will be started (for those not on it already) or given again (for those in whom seizures have occurred in spite of initial treatment) in an effort to prevent recurrent seizures. Other medications, such as lorazepam (Ativan), may be used to stop (“break”) a seizure in progress (Pre-eclampsia and Eclampsia, 2016). Magnesium sulfate is the primary medication used in the prevention and management of eclampsia seizures and exerts its effect by depressing the central nervous system, (Pre-eclampsia and Eclampsia, 2016). The antidote for magnesium toxicity is calcium gluconate 1 g IV over 3 minutes. Repeat doses may be necessary. Calcium chloride can also be used in lieu of calcium gluconate. The suggested dose for calcium chloride for magnesium toxicity is 500 mg of 10% calcium chloride IV given over 5-10 minutes (Druizin, Shields & Peterson, 2013).

#### **2.1.6.4 Challenges in Management of Pre-eclampsia and Eclampsia Patients**

Based on challenges that prevent nurses and midwives from effective management of pre-eclampsia and eclampsia in hospitals include lack of supervision, training, and inadequate resources among others. Survey by WHO (2007) shows that the Oaxaca medical record review and physician surveys indicated that half or more of women with severe pre-eclampsia (50%) and eclampsia (82%) received adequate antihypertensive medication, but use of magnesium sulfate was inconsistent. Barriers to use in Oaxaca included a tendency to use experience-based practices instead of evidence-based guidelines and a lack of supervision. Providers and

stakeholders in Oaxaca, a relatively poor area of Mexico, also noted a shortage of human and material resources and inadequate referral mechanisms.

Lack of access to basic prenatal care, safe pregnancy procedures and skilled birth attendants underlie the huge disparity in maternal and infant mortality between developed and developing countries. Approximately 1 in 48 women in developing countries and only 1 in 1800 in developed countries dies of complications of pregnancy, delivery, puerperium or abortion (WHO, 2006). Factors that contribute to poor patient management include delays and errors in diagnosis, treatment and referral, personnel and equipment shortages and health facilities that cannot manage and properly treat even the small proportion of women who reach health facilities before delivery (WHO, 2008). In the developing world, these easily preventable shortcomings affect patient outcomes adversely. A study in Viet Nam of 22 health-care institutions showed that 96 of 128 (75%) maternal deaths occurring during 1984–1985 resulted from delays or errors in diagnosis (WHO, 2008) Additional studies show that lack of medical infrastructure adversely affects patient outcomes: 70% of the 152 maternal deaths that occurred in three hospitals in Senegal in 1986–1987 were linked to lack of equipment and facilities (WHO, 2008).

There are several barriers to accurate and affordable blood pressure measurement, particularly in developing countries. These include: The absence of accurate, easily-obtainable, inexpensive devices for BP measurement, the frequent marketing of non-validated BP measuring devices, the relatively high cost of BP devices given the limited resources available, limited awareness of the problems associated with conventional BP measurement techniques and a general lack of trained manpower and limited training of personnel.

Engender Health (2007) reported that key barriers in management of eclampsia are lack of National Priority and Guidelines, lack of Education and Training, Supply Shortage, financial cost and weak health system. The nurse at three Indian hospitals stated that they had neither the knowledge nor the skills to manage eclampsia patients at the same time; they accepted that there was some hesitancy to manage such complicated cases (Jaffar,2013). The authors go on to report that; they feared being blamed for any negative outcomes that could result, even when those outcomes were a natural consequence of the condition (Jaffar, 2013).

## **2.2 Empirical Studies**

The knowledge of pre-eclampsia and eclampsia is of relevance among nurses and midwives as the care givers to eclampsia patient. For a nurse to effectively manage pre-eclampsia and eclampsia as well as identification of complication related to the disease condition, adequate knowledge is required. A study conducted by Jaffar (2013) revealed the data obtained through self-reporting questionnaire on knowledge in managing eclampsia revealed the proportion of nurses and midwives who had good knowledge on managing eclampsia to be 43%,

South African study by Stellenberg & Ngwekazi (2016) identified a gap in the knowledge of midwives about hypertensive disorders during pregnancy. Only 56.4% of the participants correctly answered the questions on the clinical manifestations of severe pre-eclampsia and 68.3% on the factors affecting BP, whereas 27.7% had no understanding about pre-eclampsia. Furthermore, 43.6% did not associate obesity as a risk factor with the development of pre-eclampsia and 36.6% had no knowledge about the effects of pre-eclampsia on the mother.

Study conducted on obstetric knowledge of nurse educators in Nigeria (2015) indicates that there was paucity of knowledge across all major causes. Only 57.2% and 62.7% of educators could

diagnose pre-eclampsia and severe pre-eclampsia, respectively. While 86% knew about MgSO<sub>4</sub> as the 'gold standard' for treating eclampsia, only 16.8% knew of calcium gluconate as an antidote to MgSO<sub>4</sub> toxicity (Mohammed, Ahonsi, Oginni, Tukur & Adoyi, 2015).

In an Egyptian study by Ahmed, Helmy & Mohamed (2017) on impact of a tailored intensive educational program upon pre-eclampsia on nurses' knowledge at Beni-Suef city, Egypt reported that only ten out of sixty study participants had knowledge on pre-eclampsia management.

Lohre & Liljevik (2012) revealed in a study on Evaluation of knowledge and management practices of hypertension in pregnancy among health care workers in Moshi, Tanzania that (58.8%) of nurses and midwives had adequate knowledge on management of eclampsia.

In a study by Bilano, *et al.*, (2014) on nurses and midwives management of pre-eclampsia and eclampsia patients appropriately in order to reduce adverse patients' outcomes, shows that mismanagement of the condition lead to maternal and perinatal morbidity and mortality and the highest maternal mortality was observed in Nigeria with 8 (3%).

Nurses and midwives skills plays a vital role in providing effective management of pre-eclampsia and eclampsia and it depends on how skilled the staffs are while attending and managing pre-eclampsia and eclampsia patients. A study conducted at Zanzibar, Pakistan by Jaffar (2013) shows 60% of respondents had poor skills (0-49%) in managing eclampsia. Only 40% score average, none of respondents scored higher or moderate skills.

Stellenberg & Ngwekazi (2016) on their report on management of hypertensive disorders during pregnancy states that only 28.9% responded correctly on prevention of pre-eclampsia and only 26.7% responded correctly about the route to be used for the administration of magnesium sulphate.

USAID (2016) on its systematic review on the treatment and management of pre-eclampsia and eclampsia in Nigeria states that, despite significant declines in maternal mortality rates, sub-Saharan Africa continues to face the burden of maternal deaths due to pregnancy related complications. Nigeria is one of the ten most dangerous countries for a woman giving birth and is reportedly responsible for 14% of the world's maternal deaths.

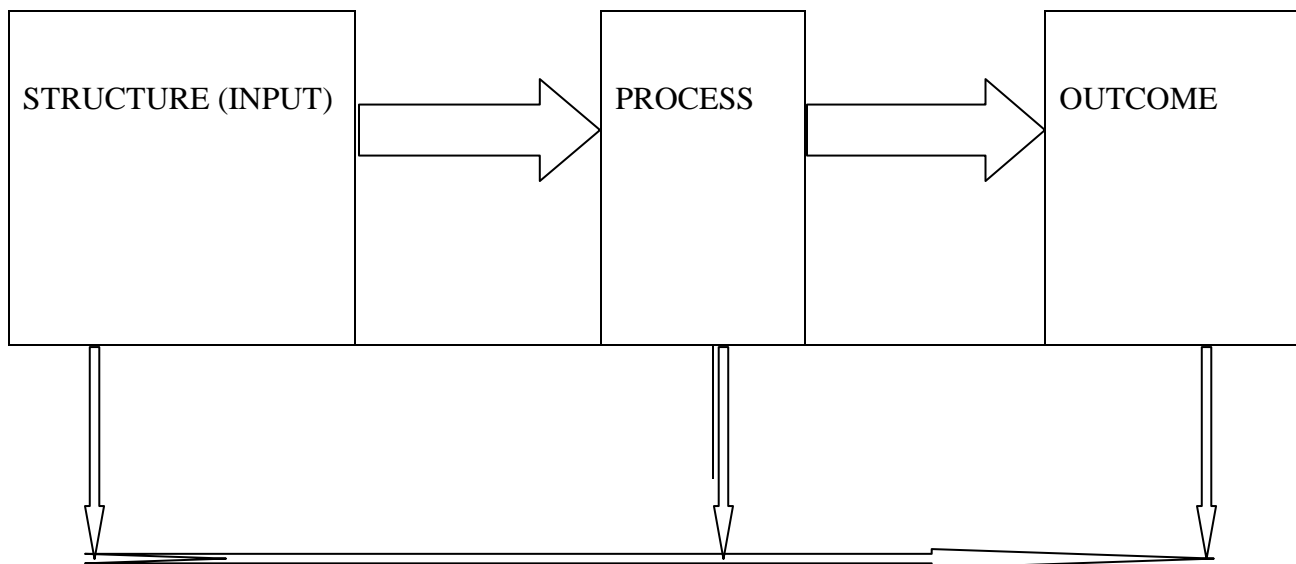
Another study by Sultan, Bashir & Khan (n.d) at Abbottabad on presentation and management outcomes of eclampsia revealed that complications were observed in 48 (70.58%) out of 68 patients. Aspiration pneumonia was seen in 8 (11.76%), renal insufficiency in 5 (7.35%), Acute Tubular Necrosis (ATN) in 2 (2.94%) and retro placental hemorrhage in 8 (11.76%) cases. Seven patients died giving a death rate of 10.29%. The perinatal mortality rate was 23.52% with prematurity being the leading cause. A study by Atanga (2016) on eclampsia management among nursing staffs revealed that cerebrovascular accident (44.5%) was found to be the leading adverse outcome of eclampsia followed by preterm birth (46.5%).

Changole (2013) reported in his study on perspectives of health care providers on management of pre-eclampsia and eclampsia in Blantyre, Malawi that there was a lack of basic but crucial resources for the management of patients with pre-eclampsia and eclampsia. He also revealed that there was inconsistent availability of magnesium sulphate in the facilities for to provide effective management to the condition.

A Pakistan study by Mir, *et al.*, (2016) on a landscaping analysis on pre-eclampsia and eclampsia reported that some facilities do not have urine testing equipment for diagnosing proteinuria and none had calcium gluconate to cater for the toxicity of magnesium sulphate.

Changole (2013) revealed that limited resources, shortage of staff among others compromised the quality of care given to pre-eclampsia and eclampsia patients as an impact on the quality of education given to the nurses and midwives from school. A study by Jaffar (2013) in her study on knowledge and skills on managing eclampsia at MnaziMmoja hospital revealed that shortage of staffs; inadequate equipment and irregular supply of drugs in facilities were among the challenges faced by nurses and midwives in maternity units.

### 2.3 Theoretical Framework



**Figure 2.1: The Donabedian Health Care Quality Model (1980).**

The theory used for the study is health care quality model propounded by Avedis Donabedian (7 January 1919-9 November 2000) was a physician and founder of the study of quality in health care and medical outcomes research.

#### 2.3.1 The Donabedian Health Care Quality Model

According to Donabedian's health care quality model, improvements in the structure of care should lead to improvements in clinical processes that should in turn improve patient outcome. (Moore, Bourgeois, Lavoie & Lapointe, 2015). The Donabedian model is a conceptual model that provides a framework for examining health services and evaluating quality of health care. According to the model, information about quality of care can be drawn from three categories: "structure," "process," and "outcomes." Structure describes the context in which care is delivered, including hospital buildings, staff, financing, and equipment. Process denotes the transactions between patients and providers throughout the delivery of healthcare. Finally, outcomes refer to the effects of healthcare on the health status of patients and populations (Donabedian, 1988).

**Structure:** It includes all the factors that affect the context in which care is delivered. This includes the physical facility, equipment, and human resources, as well as organizational characteristics such as staff training and payment methods. These factors control how providers and patients in a healthcare system act and are measures of the average quality of care within a facility or system. Structure is often easy to observe and measure and it may be the upstream cause of problems identified in process (Donabedian, 2003).

**Process:** is the sum of all actions that make up healthcare. These commonly include diagnosis, treatment, preventive care, and patient education but may be expanded to include actions taken by the patients or their families. Processes can be further classified as technical processes, how care is delivered, or interpersonal processes, which all encompass the manner in which care is delivered (Donabedian, 1980). According to Donabedian, the measurement of process is nearly equivalent to the measurement of quality of care because process contains all acts of healthcare

delivery (Donabedian, 2003). Information about process can be obtained from medical records, interviews with patients and practitioners, or direct observations of healthcare visits.

Outcome: contains all the effects of healthcare on patients or populations, including changes to health status, behavior, or knowledge as well as patient satisfaction and health-related quality of life. Outcomes are sometimes seen as the most important indicators of quality because improving patient health status is the primary goal of healthcare. However, accurately measuring outcomes that can be attributed exclusively to healthcare is very difficult (Donabedian, 1980). Drawing connections between process and outcomes often requires large sample populations, adjustments by case mix, and long-term follow ups as outcomes may take considerable time to become observable (Donabedian, 2003).

## **2.6.2 Application of the Theory to the Study**

This frame work was adopted from Donabedian (1998), in his model; he pointed out some category of factors that can lead nurses and midwives to effectively and efficiently carry out their activities. These factors include; structure, process and outcome.

### **2.6.2.1 Resources**

Structure includes factors that favor the adequate delivery of health care services in management of pre-eclampsia and eclampsia. This factor is the availability of resources which covers human resources, physical infrastructure, material resources, drugs and consumables. Such resources contribute to the proper and effective management in prevention of adverse outcome of the condition, in that case; there will be adequate number of health personnel, infrastructural facilities, medical equipment, drugs and supply consumables that help the personnel in proper management of the condition. The lack in the availability of resources mentioned earlier in our

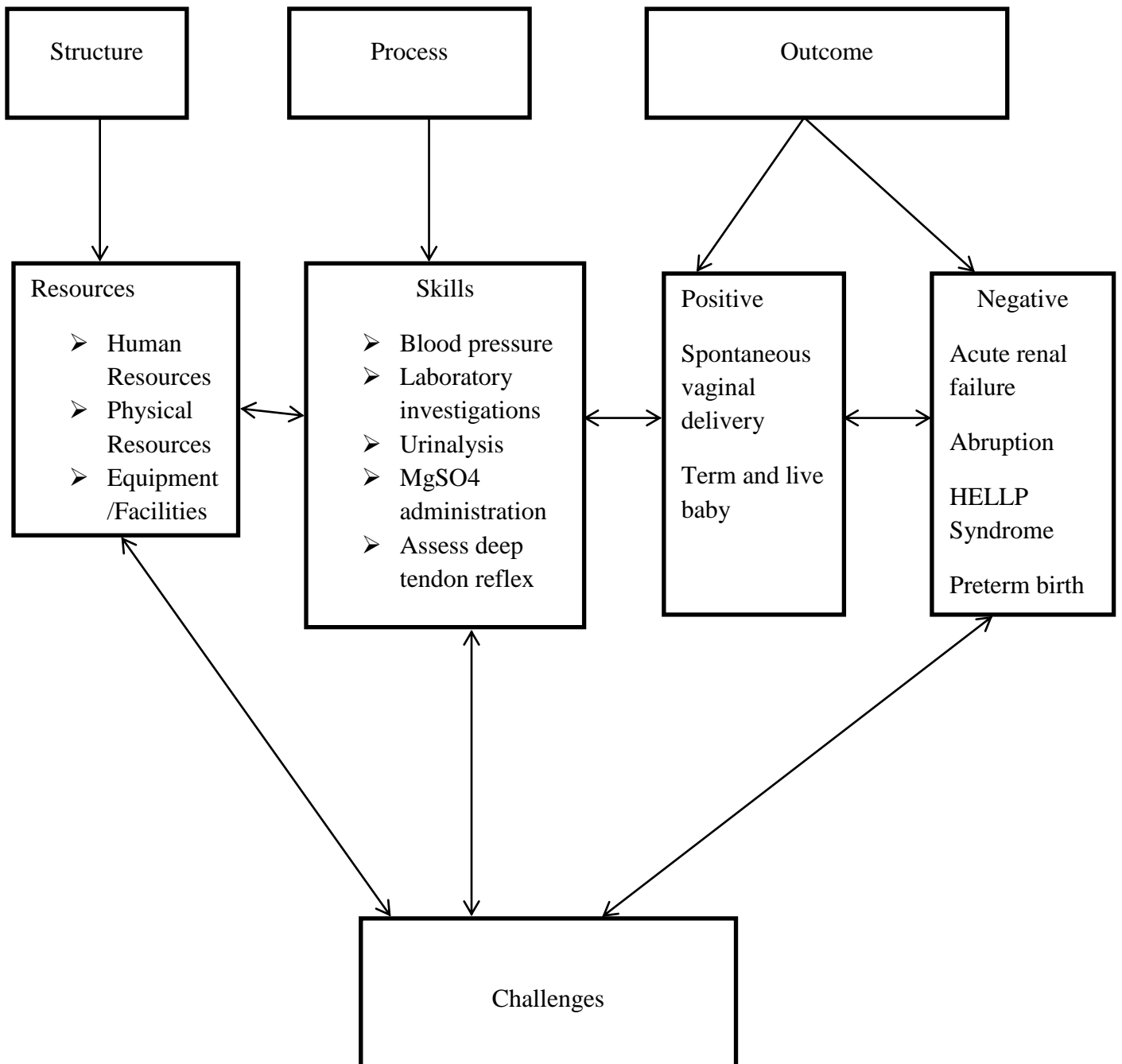
facilities plays a vital role in management of pre-eclampsia and eclampsia mainly due to inadequate resources needed for the delivery of adequate health care services in preventing adverse effects or outcomes of the condition.

### **2.6.3 Process**

Based on this model, the condition of adequate and proper knowledge as well as the competence and commitment of the health personnel in management of pre-eclampsia and eclampsia prevents the manifestations of the adverse outcome of the condition. Lack of knowledge and incompetence of the nurses and midwives to deliver proper and effective management of the condition can be of significance to manifestations of the adverse effect observed. A challenge faced by nurses and midwives serves as a barrier in proper and effective management of patient with pre-eclampsia and eclampsia.

### **2.6.4 Outcome**

In view of structure and process that preceded the outcome of pre-eclampsia and eclampsia the outcome of the condition: in a situation where process and structure are efficiently and adequately utilized in managing pre-eclampsia and eclampsia, there should be a better prognosis and the adverse manifestation of the condition will be under control. However, a poor implementation or insufficient management in structure and process leads to the manifestation of the adverse outcome of the condition, as proper health care management cannot be adequately delivered.



**Figure 2.2: Application of the theory to the study as adapted from Donabedian Health Care Quality Model**

## **CHAPTER THREE**

### **3.0 Methodology**

This study was on assessment of pre-eclampsia and eclampsia management among nurses and midwives in secondary health care facilities in Bauchi State. This chapter gives an account of research design, study area, study population, sample size determination, Validation of instrument, data collection instrument, process for data collection, data analysis and Ethical consideration.

#### **3.1 Study Design**

Cross sectional descriptive research design was employed in this study on assessment of pre-eclampsia and eclampsia management among nurses and midwives in secondary health care facilities in Bauchi.

#### **3.2 Study Setting**

This research work was carried out in secondary health care facilities in Bauchi state, which is located in Northern Nigeria. The state is bordered to the North by Jigawa, East by Gombe and Yobe states, to the west by Kaduna state and to the South by Plateau and Taraba states (Bauchi State Strategic Health Development Plan, 2010-2015). The state has a total population of 4,653,066 inhabitants (Census, 2006). At population growth rate of 3.4% per annum, it is estimated that by 2017, the total population of the state would be 6,393,612. It has three senatorial districts; Bauchi North senatorial district with seven local government areas, Central senatorial district has six LGAs and lastly South senatorial district with a total of eight LGAs. There are total of 55 tribal groups in which include Hausa, Fulani, Gerawa, Sayawa, Jarawa, Bolewa, Karekare, Kanuri, Fa'awa, Butawa, Warjawa, Zulawa, and Badawa as the main tribes.

There are cultural similarities in the people's language, occupational practices, festivals, dress and there is a high degree of ethnic interaction especially in marriage and economic existence.

There are about 1,0078 primary health care facilities at the Local Government (LGA) level, which include basic health centers, comprehensive health centers, maternity centers and dispensaries (Bauchi State Primary Health Care Development Agency, 2016). The state has 22 secondary health care facilities and of recent a secondary health facility was added and located in Bununu, Tafawa Balewa local government, making it a total of 23. The state also has two tertiary health facilities, Abubakar Tafawa Balewa Teaching Hospital and Federal Medical Centre, Azare. In addition to these, there are 74 registered private health centers and several clinics within the state. The health workers in maternity unit of secondary health care facilities are doctors, nurses and midwives, obstetrics and gynecologists, pharmacist, lab scientist, lab technicians and community health extension workers. Pregnant women are first seen by nurses and midwives in ANC clinic, they refer any abnormality to doctor on call for further management. There are usually one to two nurses or midwives in each shift that provide management to patients in maternity unit of secondary health care facility. Services rendered includes; Antenatal care services (ANC), post-natal services, post-operative services, Delivery services and management of high risk pregnancies including; hypertensive disorders, (pre-eclampsia and eclampsia), multiple gestation and gestational diabetes among others.

### **3.3 Study Population**

The population for this study comprises of all nurses and midwives in maternity units of secondary health care facilities in Bauchi state. There were a total number of 116 nurses and midwives in maternity units of secondary health care facilities in the state (Hospital Management

Board Bauchi, 2017). For the purpose of this study, the researcher used all the population of nurses and midwives in secondary health care facilities in the state.

### **3.3.1 Inclusion Criteria**

Nurses and midwives on duty in maternity units of all the 23 secondary health care facilities was included in the study and newly qualified midwives on posting.

### **3.3.2 Exclusion Criteria**

The study excluded all staff on leave, staff on contract, staff working in other wards, other health personnel, national youth service corps (nurses) and students on posting.

### **3.4 Sample Size Determination**

A total population of 116 respondents was recruited in the study using census sampling. Israel (1992) affirmed that, a census is attractive for small populations (e.g., 200 or less). A census eliminates sampling error and provides data on all the individuals in the population. As such, the entire population of all the nurses and midwives in maternity units of secondary health care facilities in Bauchi state were sampled in the study (Bauchi State Hospital Management Board, 2017).

**Table 3.1: Distribution of secondary healthcare facilities and study population**

S/N	Senatorial districts	Secondary health care facilities	Number of staff
<b>North senatorial district</b>			
1	Gamawa local government	General hospital Gamawa	1
2	Giade local government	General hospital Giade	4
3	Itas/gadau local government	General hospital Itas	2
4	Jama'are local government	General hospital Jama'are	7
5	Katagum local government	General hospital Katagum	8
6	Shira/yana local government	General hospital Shira/yana	4
7	Zaki local government	General hospital Zaki	3
<b>Central senatorial district</b>			
8	Ganjuwa local government	General hospital Ganjuwa	3
9	Dambam local government	General hospital Dambam	1
10	Darazo local government	General hospital Darazo	6
11	Misau local government	General hospital Misau	5
12	Ningi local government	General hospital Ningi	4
13	Warji local government	General hospital Warji	1
<b>South senatorial district</b>			
14	Alkaleri local government	General hospital Alkaleri	4
15	Bauchi local government	Specialist hospital Bauchi	22
		General hospital Bayara	7
16	Bogoro local government	General hospital Bogoro	4
17	Dass local government	General hospital Dass	9
18	Kirfi local government	General hospital Kirfi	5
19	Tafawa/Balewa local government	General hospital Boto	2
		General hospital Bununu	2
		General hospital Tafawa Balewa	3
20	Toro local government	General hospital Toro	9
Total	20 local governments	23 health facilities	116

### 3.5 Validation of Instrument

Content and face validity of the research instrument was assured by five Jurors from the Department of Nursing Sciences, Department of Community Medicine and Department of Obstetrics and Gynecology, Ahmadu Bello University Zaria. Their corrections were incorporated in the final draft of the questionnaire.

### **3.6 Data Collection Instrument**

Two instruments were used for the purpose of this study. These include; questionnaire and observational checklist. The whole instrument consists of six sections to cover the objectives of the study; questionnaire covers sections A, B and E while observational checklist cover sections C and D. Section A: respondents socio demographic characteristics, section B: Respondents Knowledge on pre-eclampsia and eclampsia and section E: Respondents on barriers faced by nurses and midwives while providing management to the pre-eclampsia and eclampsia patient. Section C: Assessment of nurses and midwives skills in management of pre-eclampsia and eclampsia, and section D: Assessment of resources in secondary health care facilities in Bauchi state. The instrument for measuring knowledge, resources and barriers was developed by the researcher except the instrument for measuring skills which was adapted from Johns Hopkins Program for International Education in Gynecology and Obstetrics (Jhpiego) (2011), in selection of respondent for observational checklist 50% was considered significant.

### **3.7 Process of Data Collection**

In administering the questionnaire, the researcher informed the matron in-charge of the maternity unit two days to arrival to inform the staffs. Two research assistants were trained by the researcher for the cause of data collection, together with the assistants went to the maternity unit, for introduction and the purpose of visit. The questionnaire was administered to the respondents, in which options were provided to tick. The checklist for observation was observed and recorded by the researcher alonewhile respondents were performing their routine nursing procedures in the maternity unit on pre-eclampsia and eclampsia patients. Data was collected within nine weeks.

### **3.8 Data Analysis**

After collection of data, the data was cleaned to avoid inaccuracy and errors which are inevitable to misleading findings in research, statistical analysis was conducted using excel and statistical package for social sciences (SPSS) version 23.0. Descriptive and inferential statistics were used in the study; this includes chi-square, p-value, frequency tabulation and percentage. Results were presented using tables. To assess the level of knowledge of the respondents, each correct answer was given 1 mark and no mark was given to the wrong answer, and it was scored on a scale of 0–100. Respondents with 25% or less were coded as having poor knowledge, 26–<75% as fair and 75% and above were considered as having good knowledge (Natie, Tukur, Idris, Adiri, & Taylor, 2010). The scoring system for skills in management of pre-eclampsia and eclampsia checklist was rated on 3-point scale as follows; satisfied = 2, fairly satisfied = 1 and not satisfied = 0. The scoring criteria for resources; available and functional = 2, available not functional = 1 and not available = 0. For drugs and consumables there was no standard for its analysis since patients were responsible for buying them, the grading system of items 4 and above were termed as available and adequate = 2, 2-3 items as available not adequate = 1 and 1 and below item was scored as not available = 0, the mean average gave status average for the resources.

### **3.9 Ethical Consideration**

Introductory letter (consent form) was collected from Department of Nursing Sciences, Faculty of Allied Health Sciences, Ahmadu Bello University, Zaria. Ethical clearance was obtained from Bauchi State Ministry of Health and Bauchi State Health Research Ethics Committees (HREC). In addition, oral informed consent was also obtained from the head of nursing services of each hospital, the chief matron in-charge and the participants in each maternity unit of the 23 health

care facilities in the state. An ethical principle was observed during the study and confidentiality was instituted throughout the work.

## CHAPTER FOUR

### 4.0 SUMMARY OF THE RESULTS

This chapter summarizes the results on assessment of pre-eclampsia and eclampsia management among nurses and midwives in secondary health care facilities in Bauchi state. A total of 95 questionnaires were retrieved and analyzed from 23 secondary health care facilities in the state using a statistical package of social sciences (SPSS). The results were presented using descriptive and inferential statistics below.

The statistics of the socio demographic characteristics of respondents is presented in table 4.1

**Table 4.1 Socio Demographic Profile of the Respondents**

Variables	Characteristics	Frequency	Percent (%) N=95
Respondents age	20-29 years	35	36.8%
	30-39 years	30	31.6%
	40-49 years	14	14.7%
	50-59	12	12.6%
	60>	4	4.2%
Marital Status	Married	87	91.6%
	Single	8	8.4%
	Divorced	0	0.0%
	Others	0	0.0%
Religion	Islam	57	60.0%
	Christianity	38	40.0%
	Tradition	0	0.0%
	Others	0	0.0%
Qualification	Diploma	68	71.6%
	First Degree	9	9.5%
	Masters	0	0.0%
	Others	18	18.9%
Years of Services	0-2 years	15	15.8%
	3-8 years	37	38.9%
	9-15 years	21	22.1%
	16>	22	23.2%

Table 4.1 Distribution of respondents based on their age showed that most(36.8%) and (31%)of the respondents were between the age range of 20 – 29 years and30-39 years.Very few

respondents were 60 years and above (4.2%). Distribution of respondents according to the marital status indicate that majority of the respondents (91.6%) were married, while (8.4%) of the nurses and midwives were single. Majority (60%) of the respondents was practicing Islamic religion, and (40%) were practicing Christian religion. Respondents educational qualification showed that majority (71.6%) of the respondents had diploma certificate, only (9%) of them obtained bachelor's degree. Responses based on the years of services showed that (15.8%) served for only 0-2 years. 38.9% of the studied nurses and midwives served for 3-8 years, and (23.2%) of the respondents spend more than 16 years in service.

### Item Analysis on Knowledge of the Respondents

**Table 4.2a: What is the Knowledge of Nurses and Midwives in Management of Pre-eclampsia and Eclampsia:**

N= 95				
Rank	Item number	Item	Frequency	Percentage(%)
Items receiving more than 75% correct response rate				
1	14	Magnesium sulphate Administration	95	100
2	18	Anti-hypertensive medication	94	98.9
3	20	Unconsciousness	93	97.9
3	32	Preterm birth	93	97.9
4	10	Urinalysis	92	96.8
5	31	Birth asphyxia	91	95.8
6	21	Respiratory distress syndrome	89	93.7
7	11	Blood pressure	88	92.6
8	13	Presence of seizure	84	88.4
9	3	Primigravida	83	87.4
9	22	Acute renal failure	83	87.4
9	29	Death	83	87.4
9	33	Intra uterine fetal demise	83	87.4
10	6	Previous pre-eclampsia and eclampsia	82	86.3
11	12	Laboratory investigation	80	84.2
12	1	Chronic hypertension	79	83.2
13	27	Abruptio placentae	74	77.9
14	20	Intra uterine growth restriction	72	75.8
Items receiving between 26% to 75% correct response rate				
15	5	Maternal age	66	69.5
16	17	Oxygen administration	59	62.1
16	25	Cortical blindness	59	62.1
17	8	Multifetal gestation	58	61.1
17	16	Calcium gluconate administration	58	61.1
18	28	Cerebro vascular accident	57	60.0
19	2	Obesity	56	58.9
20	4	Utero placental perfusion	55	57.9
20	26	Hepatic dysfunction	55	57.9
21	9	Low socio economic status	34	35.8
22	7	Genetic predisposition	33	34.7
23	19	Corticosteroids	31	32.6
24	24	Coagulopathy	28	29.5
25	15	Hydralazine	27	28.4
Items receiving less than 26% correct response rate				
26	23	HELLP syndrome	22	23.2

Distribution of nurses and midwives knowledge in pre-eclampsia and eclampsia management

Table 4.2a Based on the item analysis on this objective, majority (83.2%) of the respondents agreed that Chronic hypertension can be a cause/predisposing factor for pre-eclampsia and eclampsia. and Obesity (58.9%) agreed that it can also be a causative factor of this condition, (87.4%) answered that Primigravidais also among the causative factors of pre-eclampsia and eclampsia. Almost all the respondents (84.2%) in all the secondary health care facilities in the state carried out laboratory investigations for their patients in order to detect women at risk of pre-eclampsia and eclampsia, and (88.4%) of the respondents diagnosed presence of seizure as eclampsia and (92.6%) of the nurses and midwives take patient's blood pressure also in the maternity units to identify pre-eclampsia and eclampsia patients.

On the management of pre-eclampsia and eclampsia, all the studied nurses and midwives (100%) administer Magnesium sulphate to the patient in the secondary health care facilities. Majority (97.7%) of the respondents agreed that pre-eclampsia and eclampsia can lead to Unconsciousness, (93.7%) agreed that patients do come up with Respiratory distress syndrome and (87.4%) presents with acute renal failure as an adverse outcome of pre-eclampsia and eclampsia. Majority (95.8%) of the studied respondents opined that pre-eclampsia and eclampsia resulted in Birth asphyxia (95.8%), Preterm birth (97.9%) and Intra uterine fetal demise (87.4%) as adverse outcome of the condition. However, based on these results it can be concluded that respondents mostly observed that patients with pre-eclampsia and eclampsia developed some of these adverse outcome.

**Table 4.2b Grading of Nurses and Midwives Knowledge on Pre-Eclampsia and Eclampsia**

<b>Variable</b>	<b>Frequency</b>	<b>Percentage</b>	<b>N=95</b>
<b>Poor Knowledge</b>	0	0	
<b>Fair Knowledge</b>	51	53.7	
<b>Good Knowledge</b>	44	46.3	
<b>Total</b>	95	100	

a = less than 25% (respondents scored < 11)

b = 26-75% (respondents scored 12-22) and

c = >75% (respondents scored  $\geq$  23).

Table 4.2b Indicate the overall level of knowledge of nurses and midwives on pre-eclampsia and eclampsia management. Majority of the respondents possessed fair knowledge (53.7%). 46.3% of the respondents have good knowledge and none of the respondents has poor knowledge.

**Table 4.2c: Relationship between knowledge of adverse outcome and years of experience of nurses and midwives**

Knowledge of adverse outcome	Response	0 - 2years	3- 8years	9- 15years	Others	Total	X <sup>2</sup>	P-value
Acute Renal Failure	No	5(5.3)	3(3.2)	2(2.1)	1(1.1)	11(11.6)	8.519 <sup>a</sup>	.036
	Yes	10(10.5)	34(35.8)	19(20.0)	21(22.1)	84(88.4)		
Cortical Blindness	No	10(10.5)	14(14.7)	7(7.4)	4(4.2)	35(36.8)	9.153 <sup>a</sup>	.027
	Yes	5(5.3)	23(24.2)	14(14.7)	18(18.9)	60(63.2)		

There is significant association between respondents' years of experience and their knowledge of Acute Renal Failure along with Cortical Blindness (P < 0.05).

**Table 4.3: What is the skill of Nurses and Midwives in Pre-Eclampsia and Eclampsia Management?**

Variables		Frequency	Percent (%)	Mean	N=54
Antihypertensive Medication	Satisfied	51	94.4	1.9	
	Fairly satisfied	2	3.7		
	Not Satisfied	1	1.9		
Monitoring of Vital Signs	Satisfied	51	94.4	1.9	
	Fairly satisfied	3	5.6		
	Not Satisfied	0	0.0		
Laboratory Investigations	Satisfied	49	90.7	1.9	
	Fairly Satisfied	5	9.3		
	Not Satisfied	0	0.0		
Urinalysis	Satisfied	48	88.9	1.9	
	Fairly Satisfied	5	9.3		
	Not Satisfied	1	1.9		
Aggregate = 1.9		Nurses and midwives skills in management of pre-eclampsia patients			

Fifty percent (50%) of the respondents were observed while providing management to the pre-eclampsia and eclampsia patients during the time of data collection, and the aggregate mean score happen to be 1.9. This implies that most of the nurses and midwives have the necessary skills to render effective management to the patients.

Majority (94.49%) of the respondents administered Antihypertensive medication to the pre-eclampsia and eclampsia patients. Majority (88.9%) of the staff carried out Urinalysis in the maternity unit of all the secondary health care facilities in Bauchi State and majority (90.7%) of the respondents carried out Laboratory investigations.

**Table 4.3b: Nurses and Midwives Skills in Emergency Management of Eclampsia Patients**

Variables		Frequency	Percent (%)	Mean	N=54
Magnesium Sulphate Administration	Satisfied	53	98.1	1.9	
	Fairly Satisfied	0	0.0		
	Not Satisfied	1	1.9		
Catheterization	Satisfied	53	98.1	1.9	
	Fairly Satisfied	1	1.9		
	Not Satisfied	0	0.0		
Correct Positioning	Satisfied	50	92.6	1.9	
	Fairly Satisfied	4	7.0		
	Not Satisfied				
Ensure Patent Airways	Satisfied	48	88.9	1.9	
	Fairly Satisfied	6	11.1		
	Not Satisfied	0	0.0		
Application of Tongue Spatula	Satisfied	48	88.9	1.9	
	Fairly Satisfied	4	7.4		
	Not Satisfied	2	3.7		
Aspirate Secretion	Satisfied	40	74.1	1.6	
	Fairly Satisfied	8	14.8		
	Not Satisfied	6	11.1		
Monitor Blood Pressure as Warrant	Satisfied	27	50.0	1.5	
	Fairly Satisfied	27	50.0		
	Not Satisfied	0	0.0		
Close Maternal Monitoring	Satisfied	22	40.7	1.4	
	Fairly Satisfied	31	57.4		
	Not Satisfied	1	1.9		
Aggregate mean = 1.8		Skills in emergency management of eclampsia patients			

Data on the assessment of nurses and midwives skills in management of pre-eclampsia and eclampsia shows that almost all the respondents (98.1%) have skills in Administering intra muscular and intra venousmagnesium sulphate to pre-eclampsia and eclampsia patients. For Monitoring blood pressure as warrant, (50.0%) of the respondents have skills to monitor blood pressure as a routine procedure to manage pre-eclampsia and eclampsia patients. It was observed that majority (88.9%) of the respondents do ensure that patients Airway was patent while rendering care to them, and (92.6%) of the nurses and midwives have skills in putting their patients in Correct position.

**Table 4.3c: Nurses and Midwives Skills Regarding the Management of Eclampsia**

Variables		Frequency	Percent (%)	Mean	N=54
Assess Respiratory Rate	Satisfied	47	87.0	1.9	
	Fairly Satisfied	6	11.1		
	Not Satisfied	1	1.9		
Maintain Intravenous infusion	Satisfied	44	81.5	1.8	
	Fairly Satisfied	9	16.7		
	Not Satisfied	1	1.9		
Administration of Calcium Gluconate	Satisfied	46	85.2	1.7	
	Fairly Satisfied	2	3.7		
	Not Satisfied	6	11.1		
Maintenance Dose of Magnesium Sulphate	Satisfied	41	75.9	1.7	
	Fairly Satisfied	12	22.2		
	Not Satisfied	1	1.9		
Observe for Restlessness	Satisfied	36	66.7	1.6	
	Fairly Satisfied	14	25.9		
	Not Satisfied	4	7.4		
Check for cyanosis	Satisfied	19	35.2	1.1	
	Fairly Satisfied	20	37.0		
	Not done	15	27.8		
Restrict Visitors	Satisfied	22	40.7	1.0	
	Fairly Satisfied	10	18.5		
	Not Satisfied	22	40.7		
Hourly Fluid Intake and Output	Satisfied	10	18.5	0.7	
	Fairly Satisfied	20	37.0		
	Not Satisfied	24	44.4		
Auscultate Lungs for Congestion	Satisfied	11	20.4	0.5	
	Fairly Satisfied	6	11.1		
	Not Satisfied	37	68.5		
Assess Deep Tendon Reflex	Satisfied	10	18.5	0.4	
	Fairly Satisfied	1	1.9		
	Not Satisfied	43	79.6		
Aggregate mean = 1.2 Skills in management of pre-eclampsia and eclampsia patient					

Table 4.3c: showed aggregate mean score of 1.2, this indicate that nurses and midwives skills in management of the patients was fairly satisfied.. Majority (89.0%) of the respondents assessed respiratory rate of the patients satisfactorily. Majority (81.5%) of the observed respondents were able to Maintain intra venous infusion of the patients respectively in all the maternity units of secondary health care facilities in Bauchi state.For the Maintenance dose of magnesium sulphate, (75.9%) of the observed respondents were able to administer it correctly. Most of the respondents (66.7%) were seen checking the signs of Restlessness in eclampsia patients.

Furthermore, majority of the respondents (85.2%) administered calcium gluconate satisfactorily in case of toxicity, Item on Visitors restriction, (40.7%) of the respondents were not able to control them as required to provide noise free environment.

**Table 4.3d: Nurses and Midwives Skills Regarding Delivery of pre-eclampsia and Eclampsia Patients**

Variables		Frequency	Percent (%)	Mean	N=54
Delivering the Baby	Satisfied	53	98.1	1.9	
	Fairly Satisfied	1	1.9		
	Not Satisfied	0	0.0		
Parenteral Antibiotics	Satisfied	52	96.3	1.9	
	Fairly Satisfied	2	3.7		
	Not Satisfied	0	0.0		
Control of Bleeding	Satisfied	52	96.3	1.9	
	Fairly Satisfied	2	3.7		
	Not Satisfied	0	0.0		
Vaginal Examination	Satisfied	51	94.4	1.9	
	Fairly Satisfied	3	5.6		
	Not Satisfied	0	0.0		
Check for Signs of Labour	Satisfied	50	92.6	1.9	
	Fairly Satisfied	4	7.4		
	Not Satisfied	0	0.0		
Screening of Bed	Satisfied	50	92.6	1.9	
	Fairly Satisfied	3	5.6		
	Not Satisfied	1	1.9		
Monitoring Fetal Heart Rate	Satisfied	47	87.0	1.9	
	Fairly Satisfied	7	13.0		
	Not Satisfied	0	0.0		
Monitoring Progress of Labour	Satisfied	42	77.8	1.8	
	Fairly Satisfied	12	22.2		
	Not Satisfied	0	0.0		
Aggregate mean = 1.9 Skills during delivery of pre-eclampsia and eclampsia patients					

Majority of the staff (87.0%) were able to check fetal heart rate to ensure the health status and wellbeing of the fetus. To ensure patient is in labour or not, (92.6%) of the nurses and midwives do carried it out to pre-eclampsia and eclampsia patients in the maternity ward, and (77.8%) of the respondents monitor the Progress of labour accordingly.

Majority (94.4%) of the respondents carried out vagina Examination to check for signs of labour. 92.6% of the study participants screened the bed during delivery, almost all the respondents (98.1%) were observed Delivering the baby skillfully and (96.3%) of nurses and midwives Administer parenteral antibiotics as prescribed. 96.3% of the respondents successfully Control bleeding after delivery of the newborn during the time of data collection.

### 4.3e: Summary of Nurses and Midwives Skills in Pre-eclampsia and Eclampsia Management

Variable	Mean	Rule	N=54
Management of pre-eclampsia patient	1.9	Satisfied	
Emergency management of eclampsia patient	1.8	Satisfied	
Management of eclampsia patient	1.2	Satisfied	
Delivery of pre-eclampsia and eclampsia patient	1.9	Satisfied	
Grand mean = 1.7 Skills in management of pre-eclampsia and eclampsia patients			

The grand mean score in almost all the respondents' skill was satisfied, this is indicated by the fact that the grand mean is higher than the mid-point average of 1.0.

**Table 4.4: Are the Resources for Management of Pre-eclampsia and Eclampsia Patients Available:**

**Table 4.4a: Availability of Human Resources**

Variables		Frequency	Percent (%)	Mean N=54
Nurses and Midwives	Available and Adequate	19	35.2	1.4
	Available Not Adequate	35	64.8	
	Not Available	0	0.0	
Obstetrician	Available and Adequate	21	38.9	1.3
	Available Not Adequate	28	52.9	
	Not Available	5	9.3	
Skilled and Experience Staff	Available and Adequate	18	33.3	1.3
	Available Not Adequate	36	66.7	
	Not Available	0	0.0	
Available Number of Staff per Shift	Available and Adequate	15	27.8	1.2
	Available Not Adequate	37	68.3	
	Not Available	2	3.7	
Available Number of Staff in 24 Hours	Available and Adequate	7	13.0	1.1
	Available Not Adequate	45	83.3	
	Not Available	2	3.7	
Nurses Patient Ratio	Available and Adequate	7	13.0	1.1
	Available Not Adequate	46	85.2	
	Not Available	1	1.9	

Aggregate mean = 1.2

Table 4.4a: Based on the item analysis of table 4.4, it was observed that number of nurses and midwives at the facilities happen to be (35.2%) which was not adequate to provide effective management to the patients, and the Number of staffs per shift was (27.8%), the available Number of staffs in 24 hours (13.0%) and the nurse patient ratio was (13.0%), the Skilled and experience staff's (33.3%) respectively.

**Table 4.4b: Availability of Drugs**

<b>Variables</b>		<b>Frequency</b>	<b>Percent (%)</b>	<b>Mean N=54</b>
Aldomet	Available and Adequate	51	94.4	1.9
	Available Not Adequate	2	3.7	
	Not Available	1	1.9	
Nifedipine	Available and Adequate	50	92.6	1.9
	Available Not Adequate	3	5.6	
	Not Available	1	1.9	
2% Lignocaine	Available and Adequate	49	90.7	1.9
	Available Not Adequate	4	7.4	
	Not Available	1	1.9	
Magnesium Sulphate	Available and Adequate	46	85.2	1.9
	Available Not Adequate	8	14.8	
	Not Available	0	0.0	
Calcium Gluconate	Available and Adequate	38	70.4	1.6
	Available Not Adequate	12	22.2	
	Not Available	4	7.4	
Hydralazine	Available and Adequate	33	61.1	1.4
	Available Not Adequate	11	20.4	
	Not Available	10	18.5	
Amlodipine	Available and Adequate	29	53.7	1.1
	Available Not Adequate	4	7.4	
	Not Available	21	38.9	
Diazepam	Available and Adequate	15	27.8	0.7
	Available Not Adequate	8	14.8	
	Not Available	31	57.4	
Aspirin	Available and Adequate	7	13.0	0.3
	Available Not Adequate	1	1.9	
	Not Available	46	85.2	
Lisinopril	Available and Adequate	6	11.1	0.3
	Available Not Adequate	2	3.7	
	Not Available	46	85.2	
Aggregate = 1.3				

Table 4.4b: Showed that drugs were available but not adequate despite the fact that patients were able to afford them, Magnesium sulphate (85.2%). Almost all the respondents (92.6%) were observed to be using Nifedipine as a drug of choice to control mild to moderate hypertension for pre-eclampsia and eclampsia patients and also Aldomet (94.4%) respectively. It was observed also that majority (61.1%) of the respondents UtilizedHydralazine to control severe hypertension in pregnancy (53.7%) and (70.4%) of the respondents used calcium gluconate to control the toxicity of Magnesium sulphate.

**Table 4.4c: Availability of Consumables**

<b>Variables</b>		<b>Frequency</b>	<b>Percent (%)</b>	<b>Mean N=54</b>
Cannula	Available and Adequate	53	98.1	1.9
	Available Not Adequate	1	1.9	
	Not Available	0	0.0	
Iv Giving Sets	Available and Adequate	53	98.1	1.9
	Available Not Adequate	1	1.9	
	Not Available	0	0.0	
Urinary Catheter and Urine Bag	Available and Adequate	53	98.1	1.9
	Available Not Adequate	1	1.9	
	Not Available	0	0.0	
Syringe and Needles	Available and Adequate	52	96.3	1.9
	Available Not Adequate	2	3.7	
	Not Available	0	0.0	
Antiseptic Solutions	Available and Adequate	52	96.3	1.9
	Available Not Adequate	2	3.7	
	Not Available	0	0.0	
Gloves	Available and Adequate	52	96.3	1.9
	Available Not Adequate	2	3.7	
	Not Adequate	0	0.0	
Stripes for Urine Testing	Available and Adequate	51	94.4	1.9
	Available Not Adequate	3	5.6	
	Not Available	0	0.0	
Cotton Wool and Gauze	Available and Adequate	50	92.6	1.9
	Available Not Adequate	3	5.6	
	Not Available	1	1.9	
Sterile Water for Injection	Available and Adequate	50	92.6	1.9
	Available Not Adequate	4	7.4	
	Not Available	0	0.0	
Soap/detergent	Available and Adequate	50	92.6	1.9
	Available Not Adequate	4	7.4	
	Not Available	0	0.0	
Plaster and Bandages	Available and Adequate	48	88.9	1.9
	Available Not Adequate	5	9.3	
	Not Available	1	1.9	
Intravenous Fluids	Available and Adequate	47	87.0	1.9
	Available Not Adequate	7	13.0	
	Not Available	0	0.0	
Tongue Spatula	Available and Adequate	37	68.5	1.5
	Available Not Adequate	8	14.8	
	Not Adequate	9	16.7	
Oxygen	Available and Adequate	19	35.2	0.8
	Available Not Adequate	4	7.4	
	Not Available	31	57.4	

Aggregate = 1.7

Table 4.4c: Showed that almost all the consumables were available but not adequate in all the maternity units of secondary health care facilities in the state with average mean score of 1.7 except for Oxygen which was observed not to be available in most of the facilities in the state with mean score of 0.8 and Tongue spatula was also available but not adequate with average mean of 1.5.

**Table 4.4d: Availability of Physical Facilities**

<b>Variables</b>		<b>Frequency</b>	<b>Percent (%)</b>	<b>Mean</b>	<b>N=54</b>
Toilet	Available and Functional	54	100	2.0	
	Available Not Functional	10	0.0		
	Not Available	0	0.0		
Theatre Operating Room	Available and Functional	52	96.3	1.9	
	Available Not Functional	1	1.9		
	Not Available	1	1.9		
Electricity	Available and Functional	52	96.3	1.9	
	Available Not Functional	2	3.7		
	Not Available	0	0.0		
Bed	Available and Functional	51	94.4	1.9	
	Available Not Functional	3	5.6		
	Not Available	0	0.0		
Alternate source of light	Available and Functional	47	87.0	1.8	
	Available Not Functional	5	9.3		
	Not Available	2	3.7		
Portable water supply	Available and Functional	40	74.1	1.7	
	Available Not Functional	12	22.2		
	Not Available	2	3.7		
Baby cots	Available and Functional	20	37.0	0.8	
	Available Not Functional	5	9.3		
	Not Available	29	53.7		
Isolated Room	Available and Functional	12	22.2	0.4	
	Available Not Functional	42	77.8		
	Not Available	0	0.0		
Silent Room	Available and Functional	8	14.8	0.3	
	Available Not Functional	46	85.2		
	Not Available	0	0.0		

Aggregate = 1.4

In addition, all the facilities have Theatre operating rooms and were almost functional with average mean of 1.9, very few facilities (14.8%) have functional Silent room for the pre-eclampsia and eclampsia patients and isolated rooms happen to be (22.2%). It was also observed that there was Portable water supply (74.1%) in almost all the facilities, Alternate source of light (87.0%) to ease difficulties in rendering services to the patients. Electricity (96.3%) was available and functional in all the facilities with average mean of 1.9 except Bogoro General Hospital. There was availability and functional Toilets (100%) and Bed (94.4%) in all the facilities.

**Table 4.4e: Availability of Equipment**

Variables		Frequency	Percent (%)	Mean N=54
Sphygmomanometer	Available and Functional	54	100	2.0
	Available not Functional	0	0.0	
	Not Available	0	0.0	
Bed screen	Available and Functional	54	100	2.0
	Available Not Functional	0	0.0	
	Not Available	0	0.0	
Bowls	Available and Functional	54	100	2.0
	Available Not Functional	0	0.0	
	Not Available	0	0.0	
Delivery pack	Available and Functional	54	100	2.0
	Available Not Functional	0	0.0	
	Not Available	0	0.0	
Stethoscope	Available and Functional	52	96.3	1.9
	Available Not Functional	0	0.0	
	Not Available	2	3.7	
Drip stand	Available and Functional	51	94.4	1.9
	Available Not Functional	0	0.0	
	Not Available	3	5.6	
Bed Side Rail	Available and Functional	35	64.8	1.3
	Available Not Functional	2	3.7	
	Not available	17	31.5	
Suction Machine	Available and Functional	28	51.9	1.2
	Available Not Functional	11	20.4	
	Not Available	15	27.8	
oxygen Cylinder	Available and Functional	22	40.7	0.9
	Available Not Functional	9	16.7	
	Not Available	23	42.6	
Patella Hammer	Available and Functional	22	40.7	0.8
	Available Not Functional	0	0.0	
	Not Available	32	59.3	
Oropharyngeal Airway	Available and Functional	11	20.4	0.4
	Available Not Functional	0	0.0	
	Not Available	43	79.6	

Aggregate= 1.5

For the equipment, Bed side rail (64.8%) was observed to be available but not functional in the facilities, Drip stand (94.4%) and Stethoscope (96.3%) were observed to be available and functional with average mean of 1.9. Sphygmomanometer (100%), bed screen (100%), Bowls (100%) and Delivery packs (100%) were observed to be available and functional in all the maternity units of secondary health care facilities in the state with average mean of 2.0. Suction machines were available in some facilities but not functional (51.9%).

**Table 4: Summary of Availability of Resources**

<b>Variables</b>	<b>Mean</b>	<b>Rule</b>	<b>N=54</b>
Human Resources	1.2	Available	
Drugs	1.3	Available	
Consumables	1.7	Available	
Physical facilities	1.4	Available	
Equipment	1.5	Available	
Grand mean = 1.4    Availability of resources in secondary health care facilities			

The overall summary of table 4.4 above showed that the grand mean was 1.4. This signifies that there was availability of resources but, not adequate and not functional in some maternity units of secondary health care facilities in Bauchi state.

**Table 4.5a: What are the Challenges Faced by Nurses and Midwives in Providing Management to Pre-eclampsia and Eclampsia Patients?**

Variables	Frequency		Percent (%) N=95
Limited knowledge	Yes	43	45.3
	No	52	54.7
Opportunity for training	Yes	58	61.1
	No	37	38.9
Resources not available	Yes	80	84.2
	No	15	15.8
Presence of Other Health Professionals	Yes	39	41.1
	No	56	58.9
Conducive Environment	Yes	63	66.3
	No	32	33.7
Motivation	Yes	44	46.3
	No	51	53.7
Years of Experience	Yes	33	34.7
	No	62	65.3
Salary and Wages	Yes	30	31.6
	No	65	68.4
Institutional Law	Yes	35	36.8
	No	60	63.2
Lack of Supervision	Yes	41	43.2
	No	54	56.8
Work Overload	Yes	86	90.5
	No	9	9.5
Availability of Nurses and Midwives per Shift	Yes	74	77.9
	No	21	22.1
Fear of Adverse Outcome	Yes	40	42.1
	No	55	57.9
Delay in Referral Services	Yes	61	64.2
	No	34	35.8

Challenges faced by nurses and midwives in management of pre-eclampsia and eclampsia

**Table 4.5b: Summary of the challenges faced by nurses and midwives while providing management to pre-eclampsia and eclampsia patients.**

Rank	Item No	Variables	Frequency	Percent (%) N=95
1	11	Work overload	86	90.5
2	3	Resources not available	80	84.2
3	12	Availability of Nurses and Midwives per Shift	74	77.9
4	5	Conducive Environment	63	66.3
5	14	Delay in Referral Services	61	64.2
6	2	Opportunity for training	58	61.1
7	6	Motivation	44	46.3
8	1	Limited knowledge	43	45.3
9	10	Lack of Supervision	41	43.2
10	13	Fear of Adverse Outcome	40	42.1
11	4	Presence of Other Health Professionals	39	41.1
12	9	Institutional Law	35	36.8
13	7	Years of Experience	33	34.7
14	8	Salary and Wages	30	31.6

Summary of challenges faced by nurses and midwives in management of pre-eclampsia and eclampsia patient

Challenges have great influence in inhibiting the respondents from rendering effective services to the patients. Responses on work overload (90.5%) shows that respondents have strong believe that this item has great effect on the management of pre-eclampsia and eclampsia patients. Majority of the respondents (84.2%) agreed that there wasno availability of Resources to provide necessary care to pre-eclampsia and eclampsia patients. Majority of the respondents (77.9%) agreed with the fact that Absence of staff per shift can hinder the provision of services to the pre-eclampsia and eclampsia patients. Item on Conducive environment (66.3%) showed that it really hinders nurses and midwives from rendering the services effectively to pre-eclampsia and eclampsia patients. Lastly, majority of the respondents go with the idea that delay in referrals (64.2%) also serve as a challenge in management of pre-eclampsia and eclampsia patient in secondary health care facilities in Bauchi state.

## Summary of Major Findings

Results from the above findings showed the following;

1. Based on the nurses and midwives knowledge on pre-eclampsia and eclampsia management, the findings showed that most of the respondents' 95 (53.7%) had fair knowledge.
2. Result on the skills revealed that the respondents' skills were satisfactory, with the grand mean being higher than the mid-point of 1.0.
3. Based on the availability of resource for management of pre-eclampsia and eclampsia, the result from the findings revealed that there are availability of resources but some of them are not adequate/functional as the mean value was 1.4.
4. On the challenges faced by nurses and midwives while providing management to pre-eclampsia and eclampsia patients, work overload been the highest with (90.5%), followed by resources not available (84.2%), availability of nurses and midwives (77.9%), Conducive environment (66.3%) and delay in referral services (64.2%).

## **CHAPTER FIVE**

### **DISCUSSION**

#### **5.0 INTRODUCTION**

The objectives of this study was to determine level of knowledge on management of pre-eclampsia and eclampsia among nurses and midwives, to assess skills of nurses and midwives in management of pre-eclampsia and eclampsia, to assess the availability of resources for management of pre-eclampsia and eclampsia by nurses and midwives and to identify challenges faced by nurses and midwives while providing management to pre-eclampsia and eclampsia patients in secondary health care facilities in Bauchi state. Despite the fact that all the participants were fully qualified nurses and midwives, some of them had poor knowledge about the correct positioning, checking for toxicity of magnesium sulphate, aspiration of secretion and lung auscultation.

#### **5.1 Discussion of Findings**

The socio demographic profile of the respondents revealed that majority(68.4%) of the respondents were between the age range of 20-39 years, this showed that majority of them were young adults and can still render effective management to pre-eclampsia and eclampsia patients. This was not similar with the findings by Jaffar (2013) where the respondents' ages vary between 31-40 years of age. The study showed that majority (71.6%) of the respondents obtained a diploma certificate as their highest qualification, this confirm with the result from Jaffar (2013) who revealed that out of 100 study participants, (78%) obtained diploma as their qualification to serve as a midwife.

The present study showed that some(38.9%) of the respondents spent more than two years in service, this is in line with the study by Stellenberg and Ngwekazi (2016) who revealed that

majority (73.3%) of the respondents had more than three years in services, and (40.6%) had more than 10 years' experience. Their findings also agreed with that of Atanga(2016) who stated that few (38.9%) nurses and midwives had 10 years and above in the profession. The findings also revealed that, majority (53.7%) of the nurses and midwives possessed fair knowledge on management of pre-eclampsia and eclampsia. Findings of the present study is in agreement with that of Stellenberg and Ngewakazi (2016) who reported that According to the description of the third stage in a five-stage theory on competence from novice to expert, an individual is considered competent with 2–3 years of experience. Most of the study participants had more than two years of experience, some with three to ten years and very few with more than ten years of experience. Thus, they were regarded as experts in terms of skills for management of patients with pre-eclampsia and eclampsia.

Findings of this study revealed that (46.3%) of the respondents have good knowledge in management of the condition, this is in agreement with the study from Tanzania by Lohre and Liljevik (2012), (58.8%) of the health care workers had adequate knowledge regarding management of eclampsia. Findings of this study detailed on the knowledge of risk factors of pre-eclampsia and eclampsia, as the respondents agreed with them, this is similar with the study by Jeyabalan (2014) which revealed an estimated two-thirds of cases occur in first pregnancies that progress beyond the first trimester. Maternal age of the women has great influence on the condition as it is associated with pre-eclampsia. According to Jeyabalan (2014), multiple studies demonstrate a higher incidence of pre-eclampsia among older women (40 years) of age or older had almost twice the risk of developing pre-eclampsia than primips. 57.9% of the respondents agreed that utero placental perfusion might lead to the condition, excess placental volume and multi-fetal gestations were also associated with the development of pre-eclampsia, the risk

progresses in response to the number of fetus. Majority (58.9%) of the respondents agreed that obesity was also found to be among the leading factor to the condition as estimated by World Health Organization, that prevalence of obesity and overweight women (body mass index  $\geq 25$  kg/m<sup>2</sup>) to be 77% in the United States, 73% in Mexico, 37% in France, 32% in China, 18% in India, and 69% in South Africa. The finding is similar to the survey by Ahmed, *et al.*, (2017) at Beni-Suef city Egypt, who identified the risk factors of pre-eclampsia as obesity, chronic hypertension, diabetes, and first pregnancy. This study revealed that majority (97.9%) of the respondents agreed that unconsciousness was among the adverse outcome developed by the pre-eclampsia and eclampsia patients, cerebro vascular accident (60.0%) and preterm birth was (97.9%). Findings from Atanga (2016) revealed that cerebro vascular accident was found to be the leading adverse outcome of eclampsia (44.5%) and preterm birth (46.5%).

The study revealed that more than half of the respondents (57.4%) have the necessary skills to render effective management to the patients in the secondary health care facilities. Despite the knowledge and skills possessed by the study participants there is room for further/continued training on diagnoses and treatment of pre-eclampsia and eclampsia patients. This is similar to the findings reported by Ahmed, *et al.*, (2017) that nurses were in need to update training and regular assessment of their knowledge and skills regarding the early diagnosis and prompt treatment of pre-eclampsia. Findings of this study revealed that majority (94.4%) of the participants have skills in administering antihypertensive medication, (98.1%) anticonvulsants and dosage calculations satisfactorily; calcium gluconate administration was also satisfactory (85.2%). However, study participants were very poor (18.5%) in assessing deep tendon reflex. This is in line with findings from Jaffar (2013) who reported that study participants have skills on intravenous infusion, antihypertensive, anticonvulsants and urinary catheter as well. This is

not similar with what was stated in a study from northern Nigeria by Tukur, 2016 reported that calculations of dosages, detection and treatment of toxicity of magnesium sulphate had being very difficult and confusing for the nursesto practice and monitoring for toxicity using deep tendon knee reflex.

Present study revealed that very few (35.2%) respondents were able to check for cyanosis, monitoring of vital signs and check for fetal heart rate after the convulsion in eclampsia, administer oxygen when necessary and intense maternal monitoring, This is similar to what was stated by Jaffar(2013) whose findings showed most of the participants lack the necessary knowledge and skills on physical examination to check for cyanosis, check for aspiration, check vital signs and fetal heart rate needed after convulsion, it is comparable to the findings by Ferreira, *et al.*, (2016) revealed that nurses and midwives as the first contact lack the skills for careful physical examination and attention to blood pressure values and other pre-eclampsia signals, early detection of cases, the collection and monitoring of relevant laboratory tests, especially 24hour proteinuria and fetal assessment. They also emphasize in their study that most common avoidable mistake when caring for patients with pre-eclampsia is the lack of attention to blood pressure control and signs and symptoms of pulmonary edema.

Result revealed that majority (85.2%) of the study participants has skill in administering calcium gluconate to cater for the toxicity of magnesium sulphate. However the drug was not available in some facilities during data collection. This was similar with a landscaping analysis in Pakistan by Mir, *et al.*, (2016) who reported in their study that some facilities did not have urine testing equipment for diagnosing proteinuria in suspected eclampsia patients and none facility among the samples had calcium gluconate to cater for the toxicity of magnesium sulphate in a rare case.

Findings of this study revealed that there was adequacy of the resources at the facilities to provide effective management to the patients and to prevent adverse outcome of the condition.

However, basic resources for effective diagnosis and prompt management of this condition were always available in the facilities these include; sphygmomanometer, dipsticks and antihypertensive drugs. This is dissimilar to the findings by Changole (2013), his findings revealed that there was lack of the most basic but crucial resources for the management of patients with pre-eclampsia and eclampsia, these included; blood pressure apparatus, urine dipsticks, and antihypertensive drugs. It also revealed that some facilities did not have magnesium sulphate in stock at the time of data collection. However, majority (98.1%) of the nurses and midwives administered it satisfactorily to the patients. This agreed with findings by Changole, (2013) which shows that utilization of Magnesium sulphate was also negatively affected by inconsistent availability in the study facilities. This is agreed by the report from MacArthur foundation, (2014) that the service delivery challenges inherent to the use of magnesium sulfate requires a strong and effective referral system, often a challenge in under resourced health systems. Despite the fact that there were availability of resources but inadequate/functional in some facilities affects the process of delivering effective management by the respondents which in return leads to adverse outcome of the condition. This was agreed by Donabedian (Health Care Quality Model) who opined that structure can be affected by some factors that can cause problems in process of delivering quality of care in a facility that can result in to negative effects on patients' outcome.

Findings of the study showed that nurses and midwives were faced with various challenges while providing management to the pre-eclampsia and eclampsia patients, these include; shortage of nurses and midwives, obstetricians and resources at large. This is in line with the findings from Changole (2013) who has the opinion that limited resources and shortage of staff compromised the quality of care given to obstetric patients in secondary level facilities and it impacted on the

quality of education on nursing and midwifery students. This is similar to the study done in Zanzibar by Jaffar, (2013) who reported shortage of staffs, inadequate equipment and irregular supply of drugs in the facilities were among the barriers faced by nurses and midwives in providing management to pre-eclampsia and eclampsia patients. This is agreed with study from Southern Malawi by Chodzaza (2008) revealed issue of lack of postpartum care is long overdue in Malawi, unavailability of nurses and midwives in the maternity unit has contributed to delays in emergency care, almost all the midwives interviewed raised concern over this issue. Since emergencies cannot be predicted, it is important to have coverage for 24 hours.

Findings also showed that respondents provide management to the patient with limited knowledge as a challenge faced by them. This is agreed by Ahmed, Helmy and Mohammed (2017), despite recent studies recommended that nurses and midwives should not only be improving their knowledge but also their practice should be updated to ensure competence.

## **CHAPTER SIX**

### **CONCLUSION, SUMMARY AND RECOMMENDATIONS**

#### **6.0 CONCLUSION**

Findings from the study revealed that knowledge on management of pre-eclampsia and eclampsia was insufficient among the study respondents. Therefore, there should be a regular educational update program in order to acquaint the staffs of maternity unit with skills to be committed to the service.

It was observed that nurses and midwives do care for their patients in maternity unit, although most of the respondents possessed fair knowledge despite the fact that majority of their skill was satisfactory to provide effective management to the pre-eclampsia and eclampsia patients.

Findings from the study showed that faulty of some resources hinders respondents from preventing some adverse outcome by delimiting the provision of the necessary services to the patients. The study also showed that some challenges do prevent nurses and midwives in healthcare facilities to provide management accordingly to pre-eclampsia and eclampsia patient especially work overload which was avoidable in nature.

#### **6.1 SUMMARY**

The result of the study revealed that study participants have insufficient knowledge regarding the management of pre-eclampsia and eclampsia patients, they lack the basic skills in the application of the management which may be due to the inadequacy and or not functional of some resources in the facilities. Some challenges also prevent the provision of effective management of the condition.

The aim of this study was to assess pre-eclampsia and eclampsia management among nurses and midwives in secondary health care facilities in Bauchi state. The objectives were on assessment of level of knowledge of the respondents, nurses and midwives skills in management of pre-

eclampsia and eclampsia patients, assessment of availability of resources and challenges faced in management of the condition where various literatures were reviewed.

Cross sectional descriptive research design was employed in the study where it encompasses all the 98 registered nurses and midwives in secondary health care facilities of the state as census sample was utilized. Data was collected through structured questionnaire for knowledge and barriers while the observational checklist was adapted for skills and resources respectively. The result was analyzed using SPSS version 23.0 and cleaned to minimize errors affecting findings of the research.

## **6.2 RECOMMENDATIONS**

The following suggestions were made based on the findings of this study, these include;

- ✓ Nurses and midwives are to be given adequate opportunity for further education and training to acquire more knowledge on prompt diagnosis and effective management of pre-eclampsia and eclampsia through seminars and workshops in order to minimize adverse outcome.
- ✓ Community should volunteer and send their children especially girl child to school of nursing and midwifery and encourage them for better education and cater the issue of workload in maternity units.
- ✓ Management should admit more students in to school of nursing and midwifery so as to prevent workload in maternity units of secondary health care facilities in Bauchi state.
- ✓ Government should employ more staffs especially nurses midwives and obstetricians attached specifically to maternity units this will help in resulting the problem of workload by providing effective management as required in the protocol as well as the material resources.
- ✓

- ✓ High cost of treatment of pre-eclampsia and eclampsia results in ineffective management as the patients' relations are required to provide the resources for the treatment and management of the patients, it is therefore recommended that government should provide resources at a subsidized rate and there should be equal distribution in health care facilities.
- ✓ Resources such as oxygen, oxygen cylinder, suction machine which limits the nurses and midwives skills for managing the condition effectively, such resources should be provided in the facilities for effective management of the patients.
- ✓ Government should provide all the necessary resources so that there will be effective utilization by the respondents to yield positive outcome and minimizes the adverse outcome of the condition.

### **6.3 LIMITATIONS**

Limitations to this study include the following;

1. As a facility based study, generalization cannot be possible as it does not encompasses all nurses and midwives in primary and tertiary levels of health centers and those in private facilities.
2. The duration of time allocated for the collection of data is not sufficient enough, and thus contributes to lack of full information and observation of the study participants.
3. Work overload in maternity units of secondary health care facilities affects the outcome of the observation which in turns affects the outcome of the condition as well.
4. Nurses and midwives were not always on ground or available at some point in time during the time of data collection, found attending to other patients due to their shortage in the facilities as such it consumes more time.

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**APPENDIX I**

**QUESTIONNAIRE**

**INSTRUMENT FOR ASSESSMENT OF PRE-ECLAMPSIA AND  
ECLAMPSIA MANAGEMENT AMONG NURSES AND MIDWIVES IN  
SECONDARY HEALTH CARE FACILITIES IN BAUCHI STATE**

**DEPARTMENT OF NURSING SCIENCES, FACULTY OF MEDICINE,  
AHMADU BELLO UNIVERSITY, ZARIA**

Dear respondents,

I am a post graduate student of the above-mentioned institution carrying out a research on assessment of pre-eclampsia and eclampsia management among nurses and midwives in secondary health care facilities in Bauchi State. You are requested to kindly tick the most appropriate option that best suit your experience and work place.

All information given would be treated as highly confidential and it would only be used for academic purpose only.

Signed

Maryam AdamuGarkuwa

**SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS**

1. Age in years-----
2. Marital status: (a) Married [ ] (b) Single [ ] (c) Divorced [ ] (d) Others -----
3. Religion: (a) Islam [ ] (b) Christianity [ ] (c) Tradition [ ] (d) Others-----
4. Qualification: (a) Diploma [ ] (b) First Degree [ ] (c) Masters [ ] (d) Others (specify) -----
5. Years of service: (a) 0-2years (b) 2-8years (c) 8-15years (d) Others-----

## SECTION B: KNOWLEDGE OF PRE-ECLAMPSIA AND ECLAMPSIA

**Key: Tick the correct answer**

KNOWLEDGE	Yes (1)	No (0)
<b>CAUSES/RISK FACTORS</b>		
Chronic hypertension		
Obesity		
Primigravida		
Utero placental perfusion		
Maternal Age		
Previous pre-eclampsia and eclampsia		
Genetic predisposition		
Multifetal gestation		
Low socio economic status		
<b>II. DIAGNOSIS OF PRE-ECAMPSIA AND ECAMPSIA</b>		
Urinalysis		
Blood pressure		
Laboratory investigation		
Presence of seizure		
<b>III. MANAGEMENT OF PRE-ECLAMPSIA AND ECLAMPSIA</b>		
Magnesium sulphate Administration		
Hydralazine		
Calcium gluconate administration		
Oxygen Administration		
Anti-hypertensive medication		
Corticosteroides		
<b>IV. ADVERSE OUTCOME OF PRE-ECLAMPSIA AND ECLAMPSIA</b>		
Unconsciousness		
Respiratory distress syndrome		
Acute renal failure		
HELLP syndrome		
Coagulopathy		
Cortical blindness		
Hepatic dysfunction		
Abruptio placentae		
Cerebro vascular accident		
Death		
Intra uterine growth restriction		
Birth asphyxia		

Preterm birth		
Intra uterine fetal demise		

**Mean Score,  $\geq 1.0$  = Good knowledge, Fair knowledge = 0.5-1.0 and Poor knowledge =  $\leq 0.5$**

**SECTION C: CHALLENGES FACED IN MANAGEMENT OF PRE-ECLAMPSIA AND ECLAMPSIA**

Which of the following challenges do you normally face while rendering care to the patients with pre-eclampsia and eclampsia?

Ticks as many as it applies:

<b>CHALLENGES</b>	<b>YES</b>	<b>NO</b>
Limited knowledge		
Opportunity for training		
Resources not available		
Presence of other health professionals		
Conducive environment		
Motivation		
Years of experience		
Salary and wages		
Institutional laws		
Lack of supervision		
Work overload		
Availability of nurses and midwives per shift		
Fear of adverse outcome		
Delay in referral services		

**APPENDIX II  
OBSERVATIONAL CHECKLIST**

**SECTION A: CHECKLIST ON ASSESSMENT OF NURSES AND MIDWIVES SKILLS  
IN MANAGEMENT OF PRE-ECLAMPSIA AND ECLAMPSIA PATIENTS IN  
SECONDARY HEALTH CARE FACILITIES IN BAUCHI STATE.**

Key: **S**=Satisfied, **FS**=Fairly Satisfied, **NS**= NotSatisfied.

<b>SKILLS/COMPETENCE</b>	<b>S (2)</b>	<b>FS (1)</b>	<b>NS (0)</b>
Close maternal monitoring			
Monitor Blood pressure as warrant			
Ensure patent airway			
Correct positioning			
Check for Cyanosis			
Magnesium sulphate administration			
Antihypertensive medication			
Auscultate lungs for congestion			
Assess respiratory rate			
Hourly fluid intake and output			
Administration of oxygen			
Aspirate secretion			
Monitoring of vital signs			
Maintain Intra venous infusion			
Urinalysis			
Laboratory investigations			
Application of tongue spatula			
Maintenance dose of magnesium sulphate			
Monitoring fetal heart rate			
Check for signs of labour			
Monitoring the progress of labour			
Assess deep tendon reflex			
Catheterization			
Observe for restlessness			
Administration of calcium gluconate in toxicity			
Vaginal examination			
Screening of bed			
Delivering the baby			
Parenteral antibiotics			
Control of bleeding			
Restrict visitors			

Adapted from Jhpiego, (2011), Mean Score; Satisfied  $\geq 1.0$ , Fairly Satisfied = 0.5-1.0 and Not Satisfied  $\leq 0.5$ .

## SECTION B: AVAILABILITY OF RESOURCES

Key: AA= available and adequate, ANA= available not adequate, NA= not available. For equipment and facilities, AF= available and functional, ANF= available not functional and NA=not available.

<b>RESOURCES</b>	<b>AA (2)</b>	<b>ANA (1)</b>	<b>NA (0)</b>
<b>HUMAN RESOURCES</b>			
Obstetricians			
Nurses and midwives			
Available number of staffs per shift			
Available number of staffs in 24 hours			
Nurse patient ratio			
Skilled and experience staff			
<b>DRUGS</b>			
Magnesium sulphate			
Diazepam			
Hydralazine			
Amlodipine			
Aspirin			
Calcium gluconate			
Nifedipine			
Aldomet			
Esinopril			
2% lignocaine			
<b>CONSUMABLES</b>			
Oxygen			
Syringe and Needles			
Cotton wool and gauze			
Intravenous Fluids			
Sterile water for injection			
Plaster and bandages			
Antiseptic solutions			
Cannula			
IV giving sets			
Stripes for urine testing			
Urinary catheter and urine bag			
Gloves			
Tongue spatula			
Soap/detergent			

<b>PHYSICAL INFRASTRUCTURE</b>	<b>AF</b>	<b>ANF</b>	<b>NA</b>
Theatre operating room			
Silent room			
Isolated Room			
Portable water supply			
Alternate source of light			
Electricity			
Toilet			
Bed			
Baby cots			
<b>EQUIPMENTS</b>			
Bed side rail			
Drip stand			
Patella hammer			
Stethoscope			
Sphygmomanometer			
Oxygen cylinder			
Suction machine			
Bed screen			
Bowls			
Delivery pack			
Oropharyngeal airway			

Mean Score; Available and Adequate/Functional =  $\geq 1$ , Available not Adequate/Functional = 0.5-1.0 and Not adequate =  $\geq 0.5$ .

### APPENDIX III

#### RELATIONSHIP BETWEEN YEARS OF EXPERIENCE AND RESPONDENTS KNOWLEDGE

Table 1: Relationship between nurses and midwives knowledge of risk factors/causes of pre-eclampsia and eclampsia and years of experience

Knowledge of risk factors	Response	0 -2years	3-8years	8-15years	Others	Total	X <sup>2</sup>	P-value
Chronic Hypertension	No	0(0.0)	5(5.3)	3(3.2)	7(7.4)	15(15.8)	7.243 <sup>a</sup>	.065
	Yes	15(15.8)	32(33.7)	18(18.9)	15(15.8)	80(84.2)		
Obesity	No	4(4.2)	14(14.7)	8(8.4)	11(11.6)	37(38.9)	2.107 <sup>a</sup>	.550
	Yes	11(11.6)	23(24.2)	13(13.7)	11(11.6)	58(61.1)		
Primigravida	No	4(4.2)	7(7.4)	2(2.1)	1(1.1)	14(14.7)	4.487 <sup>a</sup>	.213
	Yes	11(11.6)	30(31.6)	19(20.0)	21(22.1)	81(85.3)		
Utero Placental Perfusion	No	6(6.3)	15(15.8)	9(9.5)	8(8.4)	38(40.0)	.197 <sup>a</sup>	.978
	Yes	9(9.5)	22(23.2)	12(12.6)	14(14.7)	57(60.0)		
Maternal Age	No	6(6.3)	12(12.6)	9(9.5)	3A(3.2)	30(31.6)	5.019 <sup>a</sup>	.170
	Yes	9(9.5)	25(26.3)	12(12.6)	19(20.0)	65(68.4)		
Previous Pre-Eclampsia and Eclampsia	No	1(1.1)	7(7.4)	3(3.2)	0(0.0)	11(11.6)	5.332 <sup>a</sup>	.149
	Yes	14(14.7)	30(31.6)	18(18.9)	22(23.2)	84(88.4)		
Genetic Predisposition	No	10(10.5)	22(23.2)	14(14.7)	10(10.5)	56(58.9)	2.546 <sup>a</sup>	.467
	Yes	5(5.3)	15(15.8)	7(7.4)	12(12.6)	39(41.1)		
Multi-fetal Gestation	No	5(5.3)	19(20.0)	8(8.4)	4(4.2)	36(37.9)	6.612 <sup>a</sup>	.085
	Yes	10(10.5)	18(18.9)	13(13.7)	18(18.9)	59(62.1)		
Low Socio-economic Status	No	8(8.4)	26(27.4)	12(12.6)	12(12.6)	58(61.1)	2.225 <sup>a</sup>	.527
	Yes	7(7.4)	11(11.6)	9(9.5)	10(10.5)	37(38.9)		

The years of experiences of the Nurses and Midwives is not significantly associated with the knowledge of the risk factors indicated (P> 0.05)

Table 2: Relationship between knowledge of diagnosis of the respondents and years of experience

Knowledge of diagnosis	Response	0 - 2years	3-8years	8- 15years	Others	Total	X <sup>2</sup>	P-value
Urinalysis	No	1(1.1)	0(0.0)	1(1.1)	0(0.0)	2(2.1)	3.502 <sup>a</sup>	.320
	Yes	14(14.7)	37(38.9)	20(21.1)	22(23.2)	93(97.9)		
Blood Pressure	No	1(1.1)	4(4.2)	0(0.0)	0(0.0)	5(5.3)	4.732 <sup>a</sup>	.193
	Yes	14(14.7)	33(34.7)	21(22.1)	22(23.2)	90(94.7)		
Laboratory Investigation	No	2(2.1)	3(3.2)	5(5.3)	1(1.1)	11(11.6)	4.612 <sup>a</sup>	.203
	Yes	13(13.7)	34(35.8)	16(16.8)	21(22.1)	84(88.4)		
Presence of Seizure	No	0(0.0)	6(6.3)	2(2.1)	3(3.2)	11(11.6)	2.919 <sup>a</sup>	.404
	Yes	15(15.8)	31(32.6)	19(20.0)	19(20.0)	84(88.4)		

Years of experience of respondents is not significantly associated with their knowledge of diagnosis of pre-eclampsia and eclampsia (P>0.05).

Table 3: Relationship between knowledge of management of pre-eclampsia and eclampsia and years of experience of the respondents

Knowledge of management	Response	0 -2years	3-8years	8-15years	Others	Total	X <sup>2</sup>	P-value
Magnesium Sulphate Administration	No	0	0	0	0	0	0	1
	Yes	15(15.8)	37(38.9)	21(22.1)	22(23.2)	95(100.0)		
Hydralazine	No	9(9.5)	30(31.6)	15(15.8)	13(13.7)	67(70.5)	4.175 <sup>a</sup>	.243
	Yes	6(6.3)	7(7.4)	6(6.3)	9(9.5)	28(29.5)		
Calcium Gluconate	No	8(8.4)	15(15.8)	9(9.5)	5(5.3)	37(38.9)	3.914 <sup>a</sup>	.271
	Yes	7(7.4)	22(23.2)	12(12.6)	17(17.9)	58(61.1)		
Oxygen Administration	No	8(8.4)	16(16.8)	5(5.3)	9(9.5)	38(40.0)	3.574 <sup>a</sup>	.311
	Yes	7(7.4)	21(22.1)	16(16.8)	13(13.7)	57(60.0)		
Antihypertensive Medication	No	0(0.0)	0(0.0)	1(1.1)	0(0.0)	1(1.1)	3.561 <sup>a</sup>	.313
	Yes	15(15.8)	37(38.9)	20(21.1)	22(23.2)	94(98.9)		
Corticosteroides	No	9(9.5)	26(27.4)	14(14.7)	14(14.7)	63(66.3)	.599 <sup>a</sup>	.897
	Yes	6(6.3)	11(11.6)	7(7.4)	8(8.4)	32(33.7)		

There is no significant association between years of experience of nurses and midwives and knowledge of the management of pre-eclampsia and eclampsia ( $P>0.05$ ), because none of the values are significant.

Table 4: Relationship between knowledge of adverse outcome and years of experience of nurses and midwives

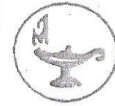
Knowledge of adverse outcome	Response	0-2years	3-8years	8-15years	Others	Total	X <sup>2</sup>	P-value
	No	0	0.0%	0	0.0%	0		
Unconsciousness	Yes	15(15.8)	37(38.9)	21(22.1)	22(23.2)	95(100.0)	0	1
Respiratory Distress Syndrome	No	1(1.1)	1(1.1)	3(3.2)	1(1.1)	6(6.3)	3.190 <sup>a</sup>	.363
	Yes	14(14.7)	36(37.9)	18(18.9)	21(22.1)	89(93.7)		
Acute Renal Failure	No	5(5.3)	3(3.2)	2(2.1)	1(1.1)	11(11.6)	8.519 <sup>a</sup>	.036
	Yes	10(10.5)	34(35.8)	19(20.0)	21(22.1)	84(88.4)		
HELLP Syndrome	No	13(13.7)	26(27.4)	18(18.9)	16(16.8)	73(76.8)	2.850 <sup>a</sup>	.415
	Yes	2(2.1)	11(11.6)	3(3.2)	6(6.3)	22(23.2)		
Coagulopathy	No	12(12.6)	24(25.3)	15(15.8)	15(15.8)	66(69.5)	1.209 <sup>a</sup>	.751
	Yes	3(3.2)	13(13.7)	6(6.3)	7(7.4)	29(30.5)		
Cortical Blindness	No	10(10.5)	14(14.7)	7(7.4)	4(4.2)	35(36.8)	9.153 <sup>a</sup>	.027
	Yes	5(5.3)	23(24.2)	14(14.7)	18(18.9)	60(63.2)		
Hepatic Dysfunction	No	4(4.2)	9(9.5)	12(12.6)	10(10.5)	35(36.8)	7.580 <sup>a</sup>	.056
	Yes	11(11.6)	28(29.5)	9(9.5)	12(12.6)	60(63.2)		
Abruptio Placentae	No	2(2.1)	8(8.4)	8(8.4)	3(3.2)	21(22.1)	4.710 <sup>a</sup>	.194
	Yes	13(13.7)	29(30.5)	13(13.7)	19(20.0)	74(77.9)		
CerebroVascular Accident	No	7(7.4)	15(15.8)	8(8.4)	6(6.3)	36(37.9)	1.656 <sup>a</sup>	.647
	Yes	8(8.4)	22(23.2)	13(13.7)	16(16.8)	59(62.1)		
Death	No	3(3.2)	3(3.2)	2(2.1)	3(3.2)	11(11.6)	1.652 <sup>a</sup>	.648
	Yes	12(12.6)	34(35.8)	19(20.0)	19(20.0)	84(88.4)		
Intra Uterine Growth Restriction	No	6(6.3)	8(8.4)	4(4.2)	6(6.3)	24(25.3)	2.462 <sup>a</sup>	.482
	Yes	9(9.5)	29(30.5)	17(17.9)	16(16.8)	71(74.7)		
Birth Asphyxia	No	1(1.1)	2(2.1)	1(1.1)	1(1.1)	5(5.3)	.094 <sup>a</sup>	.993
Preterm Birth	No	1(1.1)	0(0.0)	0(0.0)	1(1.1)	2(2.1)	3.397 <sup>a</sup>	.334
	Yes	14(14.7)	37(38.9)	21(22.1)	21(22.1)	93(97.9)		
Yes	Yes13(13.7)	32(33.7)	18(18.9)	20(21.1)	83(87.4)			.953

There is significant association between the respondents' years of experience and their knowledge of Acute Renal Failure along with Cortical Blindness (P < 0.05).





**DEPARTMENT OF NURSING SCIENCES  
FACULTY OF MEDICINE**



**AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA**

Vice-Chancellor: **Professor Ibrahim Garba**; B.Sc. (Hons) Geology, M.Sc. (Mineral Exploration) ABU, Ph.D Geology (London), D.I.C., FNMGs

Head of Department: **Professor Hayat Imam Mohammed Gommaa**, RN, NM, B.N.Sc, M.Sc, Ph.D

**POSTGRADUATE STUDENTS' DEFENCE READINESS FORM**

Date: \_\_\_\_\_

**SUPERVISORS' CONFIRMATION OF READINESS FOR DEFENSE**

We wish to affirm that ADAMU MARYAM GARKUWA  
(Name of Candidate: Surname First)

With registration number P15 MBNS8025

Is ready / not ready for course Seminar / proposal / Internal / External defense

(TICK AS APPLICABLE PLEASE)

Name of Members of Supervisory Committee

for Dr. Magdi Abdelhamid  
Chairman, Supervisory Committee

Signature / Date  
Phalke 20/04/2017

Dr. U.S. Bawa  
Member, Supervisory Committee

Bawa 13/04/17

Member, Supervisory Committee \*

Dr. BM Tukur  
Departmental Postgraduate Coordinator

Blank

Dr. S.M. Garba Phalke 20/04/2017  
Name and Signature of Head of Department



Mobile: 08170092539

e-Mail: [nursing@abu.edu.ng](mailto:nursing@abu.edu.ng)



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Head of Department: Dr. Saleh N. Garba, RN, RPHN, B.Sc, M.Sc., Ph.D., PGDE, FWACN

NURS/FM/E.2 Vol. 1/2013

15<sup>th</sup> June, 2016.

**LETTER OF INTRODUCTION**

The bearer of this letter: **Garkuwa Maryam Adamu (P15MDNS8025)** is a postgraduate student of the Department of Nursing Science, Faculty of Medicine, Ahmadu Bello University, Zaria. She is presently in the second academic year. She has finished her course work and is in the assessment phase of her research project.

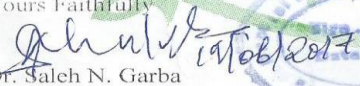
She needs necessary information for her Thesis work.

Project Coordinator's Signed: 

Date: *16/06/17*

Kindly render her any possible assistance.

Yours Faithfully

  
Dr. Saleh N. Garba  
Head of Department



Mobile: 08033667081

e-Mail: nursing@abu.edu.ng

SECRET



**GOVERNMENT OF BAUCHI STATE**  
**MINISTRY OF HEALTH**

Bello Kirfi Road, Off Murtala Mohammed Way,  
P.M.B. 065, Bauchi.

E-mail: bauchismoh@gmail.com

MOH/GEN/S/1409/I

30<sup>th</sup> June 2017

Reference.....

Date.....

**PROTOCOL REG. NO: BSMOH/NREC/18/2017**  
**PROTOCOL APPROVAL NO: NREC/12/05/2013/2017/25**

Maryam Adamu Garkuwa,  
Department of Nursing Sciences,  
Faculty of Medicine,  
ABU Zaria.



**ETHICAL CLEARANCE FOR SUBMITTED PROTOCOL:**

**“Assessment of Pre-Eclampsia and Eclampsia Management among Nurses and Midwives  
in Secondary Health Care Facilities in Bauchi State”**

The Bauchi State Health Research Ethics Committee (HREC) under the State Ministry of Health has received the above named protocol for ethical clearance and approval in line with the guidelines set by the Committee. The protocol was reviewed and the committee noted that the research falls under the low risk Category which does not entails clinical trials or any invasive procedures.

2. Consequently, the Committee hereby granted expedited approval for the research to be conducted. However, you should share with us your workplan clearly indicating the start date, where and when to visit the research site(s) and also **the final results of your findings**.
3. The Committee requires you to comply with all Institutional Guidelines, Rules and Regulations and with the tenets of the National Health Research Ethics Committee Code including that all adverse events are reported promptly to the Committee. **No changes are permitted in the research without prior approval by the Committee** except in circumstances outlined in the Code. The Committee reserves the right to conduct compliance visit to your research site without prior notice.
4. Thank you.

(Usman U. Muhammad)  
For: Hon. Commissioner.

SECRET



**DEPARTMENT OF NURSING SCIENCES**  
**FACULTY OF ALLIED HEALTH SCIENCES**  
**COLLEGE OF HEALTH SCIENCES**  
**AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA**



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**Head of Department: Dr. Saleh N. Garba,** RN, RPHN, B.Sc, M.Sc., Ph.D., PGDE, FWACN


13<sup>th</sup> July, 2018


The Dean,  
School Of Postgraduate Studies  
Ahmadu Bello University,  
Zaria.

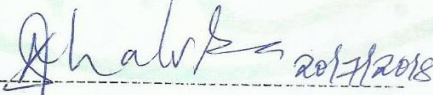
Dear Sir,

**CERTIFICATION TO CORRECTION OF DISSERTATION**

We certify that all the corrections pointed out during the oral/ external examination of the dissertation titled **“Assessment of Eclampsia Management among Nurses and Midwives in Secondary Health Care Facilities in Bauchi State, Nigeria.”** written by Maryam Adamu Garkuwa P15MDNS8025 has been made to our satisfaction.

  
-----  
Dr. M.A. Lukong  
(Internal Examiner)  
Department of Nursing Sci.  
A.B.U, Zaria

  
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Dr. H.U. Sulayman  
(Internal Examiner)  
Department of O & G  
A.B.U, Zaria

  
-----  
Dr. S.N. Garba  
Head of Department



**DEPARTMENT OF NURSING SCIENCES**  
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**Head of Department:** Dr. Saleh N. Garba, RN, RPHN, B.Sc, M.Sc., Ph.D., PGDE, FWACN


30<sup>th</sup> August, 2018

The Dean,  
School Of Postgraduate Studies  
Ahmadu Bello University,  
Zaria.


Dear Sir,

**CERTIFICATION TO CORRECTION OF DISSERTATION**

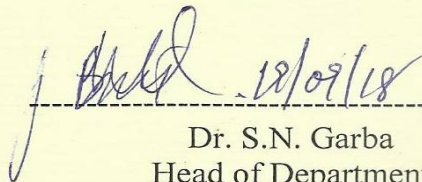
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 18/09/18

Dr. H. U. Sulayman  
Dept. of Obstetrics & Gynaecology  
A.B.U.T. H., Shika.

 19/09/18

Dr. M. A. Lukong  
Dept. of Nursing Science  
A. B. U., Zaria

 18/09/18

Dr. S.N. Garba  
Head of Department