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Management and Outcome of Preeclampsia among Pregnant Women in University of Calabar Teaching Hospital (UCTH), Calabar

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Abstract

Purpose: A retrospective research was carried out to elicit the management and outcome of preeclampsia among women in maternity unit of University of Calabar Teaching Hospital, Calabar between January, 2013 to December, 2017. This study was brought about due to prevalence of preeclampsia and its associated complications. Objectives: Three (3) specific objectives were to determine prevalence of preeclampsia, the treatment regimen utilized in management of preeclampsia and the outcome of preeclampsia among pregnant women in maternity unit of UCTH. Methods: The sample size was 197 charts of pregnant women suffering from preeclampsia. Data was extracted through the use of checklist, no sampling technique was used. The instrument was validated by the researchers' who checked for face validity. Data was collected by reviewing records and folders of pregnant women that were diagnosed of preeclampsia. Results: The result revealed that the prevalence of preeclampsia from January, 2013 – December, 2017 was 7.34%. Conclusions: Based on the finding, conclusion were made that regular training workshops and seminars for midwives, medical practitioners, and other relevant health workers on preeclampsia and the current advances in its management will go a long way to rescue patients during the crisis.
Keywords: Management; Outcome of preeclampsia; Pregnant women; University of Calabar teaching hospital.

1. Introduction

1.1. Background to the Study

Globally and in the health care delivery system preeclampsia is a syndrome characterized by hypertension and proteinuria that occurs during the second and third trimester of pregnancy. It can cause disseminated intravascular coagulation, vasospasm, sodium retention, and seizures; the occurrence of seizures in a pre-eclamptic women marks the onset of eclampsia. The end stage of pre-eclampsia is eclampsia which 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 usually multifactorial including cerebral vasoconstriction, ischemia, vasogenicedema, or other pathology. Although eclampsia occurs mostly in women with severe pre-eclampsia, there is no convincing test for predicting its onset. Although preeclampsia currently is a significant clinical problem, its impact is likely to increase as conditions that place a woman at risk for preeclampsia, such as diabetes and obesity, continue to become more prevalent. Together with other hypertensive diseases of pregnancy, it is one of the leading cause of maternal, fetal and neonatal mortality and morbidity especially in resource limited-settings where diagnosis and obstetric management are deficient [1].

Pre-eclampsia can be defined as the presence of a systolic blood pressure (sbp) greater than or equal to 140mmhg or a diastolic blood pressure (dbp) greater than or equal to 90mmhg or higher, on two occasions at least 4 hours apart in a previously normotensive patient. It can also be defined as a sbp greater than or equal to 160 mm hg or a dbp greater than or equal to 110mmhg or higher (when hypertension can be confirmed within minutes to facilitate timely antihypertensive therapy). Although, mortality from preeclampsia and eclampsia is highest in underdeveloped countries, the burden of disease and mortality in developed countries is considerable as well. Pre-eclampsia contributes to maternal and perinatal mortality and morbidity worldwide. Over the years, studies reveal that there is variation in its incidence and prevalence. In the united states, almost 20% of pregnancy-related deaths after 20weeks' gestation are attributed to complications from preeclampsia and eclampsia [2]. Globally, pre-eclampsia complicates about 2-10% of pregnancies. According to the world health organization (who) its incidence is seven times higher in developing countries (2.8% of live births) than in developed countries (0.4%) [3]. Preeclampsia is the leading cause of maternal morbidity and mortality worldwide, affecting 5-7% of first pregnancies and recurringin 13-18% of subsequent pregnancies [4]. However, in nigeria, the incidence of eclampsia lies in the range of 0.3 per 1000 deliveries in calabar (cross river state) to as high as 9 per 100 deliveries in birnin kudu (jigawa state) [5, 6].

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Although numerous clinical and biochemical tests have been proposed for prediction or early detection of preeclampsia, most remain unrealistic for general use in most developing countries. At present, there is not a single reliable and cost-effective screening test for preeclampsia which can be recommended for use in most developing countries. Some studies on uterine artery have found that doppler and first-trimester maternal serum are markers for early detection of preeclampsia [7]. Nonetheless, there is not enough evidence to suggest their routine use in clinical practice, more so in resource poor settings. In terms of prophylaxis, aspirin therapy has shown to be beneficial in decreasing the occurrence of preeclampsia in specific populations, for example, those with abnormal second trimester uterine doppler flow [8]. However, to recommend its widespread use in all patients is not judicious or evidence based. In the same vein, even though some studies had stated some benefit in calcium supplementation, particularly for those at greatest risk and those with low baseline calcium intake, the problem of selecting appropriate patients to be started on the therapy can be burdensome from a public health perspective. Similarly, findings of earlier studies which had indicated the benefits of vitamin supplementation have been refuted by a recent study by the who particularly for vitamins c and e [9]. Pharmacological treatment of preeclampsia is limited to symptomatic control of blood pressure and seizure prophylaxis. In treating blood pressure extensive evidence has accumulated over the years on the safety and efficacy of the blocker labetalol, presently considered first choice and with which effective control can be achieved in 80% of pre-eclamptic patients [10]. The management of severe pre-eclampsia entails the use of antihypertensive drugs to control the blood pressure, anticonvulsants for seizure prophylaxis and delivering the fetus as soon as it is viable. Seizure prophylaxis employs the use of drugs such as diazepam, phenytoin and magnesium sulfate (mgso4). There is overwhelming evidence to suggest that mgso4 is superior to other anticonvulsants in the management of severe pre-eclampsia/eclampsia. In line with this, there has been increasing use of mgso4 in health institutions in nigeria. From the year 2007, the use of intramuscular mgso4 regimen replaced diazepam in the protocol for the management of preeclampsia/eclampsia healthcare centres in nigeria [11].

However, the perinatal outcomes in women with preeclampsia are poor, especially if preeclampsia is of early onset and is severe. Past studies have shown that maternal and perinatal outcomes among preeclampsia women at 24 and 34 weeks of gestation is a perinatal mortality of 5.4% although the neonatal morbidities is always high especially in early gestation. Therefore, the etiology of pre-eclampsia is elusive and management depends on early detection, antihypertensive treatment, seizure prophylaxis and rapid delivery in severe cases. Pre-eclampsia is a leading cause of iatrogenic premature delivery. Because pre-eclampsia is a progressive disorder, delivery minimizes severe maternal morbidity although it increases neonatal morbidity and mortality because of prematurity.it is against this background that the researcher seeks to assess the management and outcome of preeclampsia among pregnant women in university of calabar teaching hospital (ucth), calabar, cross river state, nigeria.

1.2. Statement of Problem

Worldwide, the incidence of preeclampsia ranges between 2% and 10% of pregnancies. The incidence of preeclampsia, the precursor to eclampsia, varies greatly worldwide. Who estimates the incidence of preeclampsia to be seven times higher in developing countries (2.8% of live births) than in developed countries (0.4%) [12]. The incidence of eclampsia in the developed countries of north america and europe is similar and estimated to be about 5–7 cases per 10,000 deliveries. On the other hand, incidence of eclampsia in developing nations varies widely, ranging from 1 case per 100 pregnancies to 1 case per 1700 pregnancies. Rates from african countries such as south africa, egypt, tanzania, and ethiopiavary from 1.8% to 7.1% [11].

In nigeria, the prevalence of pre-eclampsia ranges between 2-16.7%. This high rates are as a result of limited access to health care due to a number of factors resulting in three levels of delay. These level of delay are; delay in the decision to seek care, delay in reaching the health facility and delays in health service provision. Delayed responses at the household level to obstetric emergencies often arise as a result of inadequate information on when to seek help and sometimes on where to seek help. This is worsened by lack of decision-making power, poverty, and the rising cost of health care. Lack of access to quality care has been said to be the main obstacle to reducing maternal mortality in low-income countries. In nigeria, for example, up to 50% of rural women live more than 5km from the nearest hospital, and many have no way to get to health facilities except by walking: even when in labour.

The inequitable distribution of health facilities which is in favour of urban communities is also contributory. Delays which arise in health facilities have also been shown to prevent women from receiving the care they need before, during, and after childbirth. For instance, in many countries where the health insurance scheme is still in the teething stage, getting care in emergencies may be impossible for the poor or insured. Observations have shown that the attitudes of health service providers and perceived poor quality of care are also identified as barriers. This is made worse by the lack of trained personnel and lack of equipment and supplies.

For instance, even though the efficacy of magnesium sulphate has been documented by several researchers, studies have shown that magnesium sulphate was not routinely administered, and use is often limited to teaching hospitals. Lack of availability of the drug and appropriate health personnel required for its administration as well as cost were the frequently raised obstacles. This was evidently observed during the researcher's clinical supervision of students at ucth, calabar [13]. Therefore, this study aims to assess the management and outcome of preeclampsia among pregnant women in university of calabar teaching hospital (ucth), calabar.

1.3. Purpose of Study

The purpose of this study is to assess the management and outcome of preeclampsia among pregnant women in university of calabar teaching hospital (ucth), calabar.

1.4. Specific Objectives

The Specific Objectives of This Study Were To;
i. Identify the strategies used for management of preeclampsia among pregnant women in university of calabar teaching hospital (ucth), calabar from january, 2013 to december, 2017.
ii. Assess the outcomes of preeclampsia management among pregnant women in university of calabar teaching hospital (ucth), calabar from january, 2013 to december, 2017.

1.5. Research Questions

i. What are the strategies used for management of preeclampsia among pregnant women in university of calabar teaching hospital (ucth), calabar from january, 2013 to december, 2017?
ii. What are the outcomes of preeclampsia management among pregnant women in university of calabar teaching hospital (ucth), calabar from january, 2013 to december, 2017?

1.6. Research Hypothesis

There is no significant association between management and outcomes of pre-eclampsia among pregnant women in ucth, calabar.

2. Literature Review

2.1. Management of Preeclampsia Among Pregnant Women

The magpie trial collaborative group performed an international (33 countries), randomized, multicenter, placebo-controlled study to assess the safety, efficacy, and post-administrative effects of magnesium sulfate infusion for preeclampsia and included 10,141 women. To be eligible for the study, women had to be pregnant or within 24 hours postpartum and had to have blood pressure values of greater than 140/90 mm hg and urine protein values of 1+ or greater on a urine dipstick test. Study participants were randomized to receive magnesium sulfate or placebo [14].

In an effort to further assess the safety of magnesium sulfate in the treatment of eclampsia, Belfort, *et al.* [15] conducted a randomized clinical trial in 21 women with severe preeclampsia. The study outcome measure was the effects of nifedipine and magnesium sulfate on cerebral perfusion pressure. Nine patients were randomly selected to receive nifedipine 60mg orally every four hours, and 12 patients were randomized to receive magnesium sulfate 6-g injection followed by 2g/hr by infusion. Cerebral perfusion pressure was measured 30 minutes post-administration. The findings suggest that nifedipine increased cerebral perfusion pressure in comparison with magnesium sulfate, an effect that is detrimental to cerebral tissue.

Belfort, *et al.* [16], further investigated the comparative effectiveness of magnesium sulfate and nifedipine for the prevention of pre-eclampsia and concluded that magnesium sulfate was more effective. In an un-blinded, multicenter trial, 1650 women with severe preeclampsia were randomized to receive either 60mg of nifedipine orally every 4 hours or magnesium sulfate from enrollment to 24 hours postpartum according to an institution protocol. Hypertension was controlled using hydralazine iv. The primary outcome measure was the development of an eclamptic tonic-clonic seizure. Results indicated that women who received nimodipine were more likely to have a seizure than women who received magnesium sulfate (21 of 819 [2.6%] versus 7 of 831 [0.8%], respectively; *p* = 0.01). There were no significant differences in neonatal outcomes between the two groups. More women in the magnesium sulfate group required additional blood pressure control with the use of hydralazine (54.3% versus 45.7%, *p* < 0.001).

In a cohort study on maternal and perinatal outcome of patients with severe pre-eclampsia in a tertiary health centre in south-western nigeria, Lamina, *et al.* [11] reported that there was 197 cases of severe pre-eclampsia and 4682 deliveries which gave a prevalence rate of 4.2%. The mean age of the participants were 31.2 ± 6.7 years with a range of 19-48years. The modal age group was 30-39years. The diazepam cohort consisted of 123 women while the mgso4 cohort had 74 women. None of the patients in the mgso4 group had seizures after the commencement of the drug. Three women in the diazepam group had 2 to 4 episodes of tonic-clonic seizures each. There were no maternal deaths in either of the groups. Fifty-seven neonates from the diazepam group had low apgar score at 1 minute as against 35 neonates from the mgso4 group. There was no statistical significant difference in terms of propensity of babies from either group to low apgar score at 1 minute [or= 0.84,ci 0.45 1.56]. On the other hand, 32 and 14 neonates from the diazepam and mgso$_4$ groups respectively had low apgar score at 5 minutes. Babies from diazepam group were more likely to have low apgar score at 5 minutes but the association was not statistically significant [or= 1.47, ci 0.76, 2.82].

The only cure for pre-eclampsia is delivery. Pregnant women are always at increased risk of seizures, placental abruption, stroke and possibly severe bleeding until their blood pressure decreases. If its high blood pressure or hypertension occurs too early in pregnancy, delivery may not be the best thing for the baby [17]. If a pregnant woman is diagnosed with preeclampsia, the doctor will let her know how often she will need to come in for prenatal visits; likely more frequently than what's typically recommended for pregnancy. She will also need more-frequent blood tests, ultrasounds and non-stress tests than would be expected in an uncomplicated pregnancy [18]. According to [19], possible treatment or management for preeclampsia may include; the use of medications that reduce hypertension, corticosteroids and anticonvulsant medications. World Health Organization [12], recommended hydralazine, labetalol, nicardipine, sodium nitro-prusside, beta-adrenergic blockers, diuretics, nifedipine, magnesium sulphate (mgso$_4$) as the drugs which can be used for treating pre-eclampsia.

2.1.1. Hydralazine

Intravenous hydralazine is a commonly administered arteriolar vasodilator that is effective for hypertensive emergencies associated with pregnancy. The onset of action is 10-20 minutes. The recommended dosage of hydralazine hydrochloride is 5-10 mg (i.v. or i.m.) every 15 minutes up to a maximum dose of 30mg or 20mg. If the patient experiences no change in blood pressure after 20 minutes, an alternative agent should be considered. The most common adverse effect of hydralazine administration is unpredictable hypotension, which may be caused by individual pharmacogenomic variations in drug metabolism that involve fast or slow acetylation of the drug. Administration of hydralazine may occur in a non-intensive care area if patients are closely monitored. Clinicians should be cautioned regarding its tolerability. other common adverse effects include reflex tachycardia, placental abruption, headaches, palpitations, flushing, epigastric pain, and fluid retention [20].

2.1.2. Labetalol

Labetalol is a nonselective, competitive β-adrenergic blocker and a selective, competitive α_1-adrenergic blocker (ratio of blockade, 7:1, respectively). Labetalol decreases svr and heart rate. It reduces peripheral vascular resistance without reducing peripheral, cerebral, coronary, or renal blood perfusion. The onset of action after injection is 5 minutes, with a peak plasma concentration achieved at 10-20 minutes and a duration of action of six hours. To control acute severe hypertension in pregnant women with preeclampsia, the recommended initial dose of labetalol hydrochloride is 20mg by slow, direct labetalol iv. Injection. Doses greater than 20mg may precipitate hypotension. This agent may be preferred because of a lack of reflex tachycardia, hypotension, or increased intracranial pressure. Administration of labetalol should preferentially be initiated and continued in an intensive care area [12].

2.1.3. Nicardipine

Nicardipine, a calcium-channel blocker, has been shown to be effective in patients with preeclampsia and may be an option for blood pressure management in such patients. Nicardipine has higher selectivity for blood vessels than the myocardium and causes less reflex tachycardia than nifedipine. The antihypertensive effects of nicardipine iv are seen within 10 minutes following infusion, with sufficient blood pressure reduction typically occurring within 20 minutes. Nicardipine hydrochloride is administered by infusion at a recommended initial rate of 5 mg/hr. The dosage of nicardipine hydrochloride may be adjusted upward by 2.5 mg/hr every 5 minutes until a 15% reduction in mean arterial pressure has been obtained or a maximum dosage of 15 mg/hr has been reached [21].

2.1.4. Diuretics

Diuretic therapy is used with extreme caution in patients with preeclampsia because overuse may lead to further decreases in maternal blood volume. Other common adverse effects of diuretics in patients with preeclampsia include additional hyperuricemia, hypokalemia, and hemorrhagic pancreatitis. The use of diuretics is restricted if there are signs of reduced placental perfusion or fetal growth restriction [12].

2.1.5. B-Adrenergic Blockers

The use of β-adrenergic blockers in the treatment of severe preeclampsia has been limited. Atenolol has been associated with fetal growth restriction, secondary to vasoconstriction. Fetal distress and bradycardia have been reported following the use of small in patients with preeclampsia [21].

2.1.6. Nifedipine

Nifedipine, an oral calcium-channel blocker that exerts its effects as a selective renal arteriolar vasodilator and natriuretic, has limited use in the treatment of acute, severe preeclampsia. Nifedipine increases the cardiac index and lowers blood pressure without reducing placental blood flow [12].

2.1.7. Magnesium Sulfate

The drug of choice for the prevention and control of maternal seizures in patients with severe preeclampsia or eclampsia during the peri-partum period is magnesium sulfate ($mgso_4$). Therapeutic serum magnesium levels cause cerebral vasodilation, thereby reversing the ischemia produced by cerebral vasospasm during an eclamptic episode [22]. A loading dose of 4-6g of magnesium sulfate may be administered by infusion over 20 minutes followed by a continuous infusion of 2g/hr. Magnesium is excreted in the urine, and impaired renal function may affect serum magnesium levels. The goal serum magnesium concentration range is considered to be 4-8 mg/dl (2.0-3.5mmol/l) [23]. Higher serum magnesium concentrations may precipitate adverse effects such as loss of tendon reflexes (at concentrations of >12mg/dl), respiratory depression (at concentrations of >14mg/dl), muscular paralysis and respiratory arrest (at concentrations of 15-17mg/dl), and maternal cardiac arrest (at concentrations of 30-35mg/dl). Magnesium has been shown to be superior to phenytoin and diazepam for the treatment of eclamptic seizures [24]. The use of magnesium therapy for mild preeclampsia is not currently considered to be the standard of care, and its use in such patients should be considered on an individual basis [12].

2.2. Outcomes of Preeclampsia Management Among Pregnant Women

In a cohort study on maternal and perinatal outcome of patients with severe pre-eclampsia in a tertiary health centre in south-western nigeria, Lamina, *et al.* [11] reported that, out of the 197 women studied, 169 (85.8%) had a

prolonged hospital stay: 53 (71.6%) women in the mgso4 group and 116 (94.3%) in the diazepam group. The observed difference was statistically significant [or= 6.09, ci 2.25, 17.40, p< 0.001] one hundred and ninety-seven pre-eclamptic women delivered 201 babies (4 were twin deliveries): 73 babies died within the perinatal period giving a perinatal case fatality rate of 36.3%. There were 23 perinatal deaths (21 stillbirths and 2 early neonatal deaths) in the mgso4 group which did not vary significantly with the 50 perinatal deaths (32 stillbirths and 18 early neonatal deaths) in the diazepam group. However, there was statistical significant difference between the two groups in terms of early neonatal deaths, babies in the diazepam group had more propensity to suffer early neonatal death than babies in the mgso4 group [or= 5.26, ci1.35, 23.92, p< 0.05]. Forty-nine stillbirths occurred in 132 mothers who were referred while 4 stillbirths occurred in 65 mothers who were booked. Babies who were born by mothers who were referred were more likely to suffer stillbirth than babies who were born by mothers who were booked (or=9.20, ci 3.45, 25.89, p < 0.05). The perinatal mortality rates were 48.5% and 13.9% for babies born by referred and booked mothers respectively (or=5.67, ci2.72, 11.99, p< 0.05).

In a study by Pettit and Brown [25], which was quantitative, the maternal outcomes were compared between women in their first months of pregnancy; those who had early onset preeclampsia and those who presented signs of preeclampsia later, and were also full term [25]. The study was done to determine whether the full term women with preeclampsia and their foetuses would have better maternal outcomes when compared with women who presented either late pre-term or early-onset pre-eclampsia. In the study period during 1991-2011, 4657 pregnancies complicated by hypertensive disorders were recorded, out of which 2148 had preeclampsia. Six maternal outcomes were looked at which were: episodes of severe hypertension, proteinuria, acute kidney injury, abnormal liver function, thrombocytopenia and neurological complications. The results concluded that women with late pre-term and those with full term pregnancies with preeclampsia had similar rates of maternal and foetal outcomes. However, when compared to the women with full term pregnancy preeclampsia, in those with early-onset preeclampsia there were similar rates of adverse maternal outcomes, and their babies had considerably increased rates of both morbidity and mortality. This proved that preeclampsia caused drastic maternal organ involvement regardless of the age of gestation during its onset and was a significantly serious maternal disorder.

Altman, et al. [14], reported that the primary outcome measures were eclampsia with or without fetal demise depending on time to randomization. The results indicated that women receiving magnesium sulfate therapy had a 58% lower risk of eclampsia (95% confidence interval [ci], 40-71%) than women receiving placebo (0.8% risk in patients receiving magnesium sulfate versus 1.9% in patients receiving placebo). Magnesium sulfate therapy resulted in 11 fewer women per 1000 studied who developed eclampsia. Maternal mortality was lower among women treated with magnesium sulfate (relative risk [rr] = 0.55, 99% ci, 0.26-1.14). For women randomized before delivery (treatment group [n = 576] versus placebo group [n = 588]), there was no significant difference in the risk of fetal demise, 12.7% versus 12.4%, respectively, with an rr of 1.02 (99% ci, 0.92-1.14). There was a significant difference in maternal or fetal morbidity related to placental abruption with an rr reduction of 0.67 (99% ci, 0.45-0.89) in patients receiving magnesium sulfate. The results of the trial suggest that magnesium sulfate therapy prevents eclampsia and may reduce the risk of maternal death.

Belfort, et al. [16], investigated the comparative effectiveness of magnesium sulfate and nifedipine for the prevention of pre-eclampsia and concluded that magnesium sulfate was more effective. In an un-blinded, multicenter trial, 1650 women with severe preeclampsia were randomized to receive either 60mg of nifedipine orally every 4 hours or magnesium sulfate from enrollment to 24 hours postpartum according to an institution protocol. Hypertension was controlled using hydralazine iv. The primary outcome measure was the development of an eclamptic tonic-clonic seizure. Results indicated that women who received nimodipine were more likely to have a seizure than women who received magnesium sulfate (21 of 819 [2.6%] versus 7 of 831 [0.8%], respectively; p = 0.01). There were no significant differences in neonatal outcomes between the two groups. More women in the magnesium sulfate group required additional blood pressure control with the use of hydralazine (54.3% versus 45.7%, p < 0.001).

2.3. Theoretical Framework

The theoretical framework used for this study is health belief model.

2.3.1. Health Belief Model

Health belief model (hbm) developed by becker and rosenstock in 1974 was used as the conceptual frame work for this study. A model is a symbolic depiction of reality and uses diagrams and symbols to represent ideas. The hbm is one of the most widely used conceptual framework for understanding health behaviours and is believed to lay the foundation of this study which enables the researcher to discover what is known or unknown about the topic of interest in order to conduct research that adds to the body of knowledge [26].

According to the hbm, individuals' intentions to participate in preventive health behaviour are determined by five main factors, namely:

i. Perceived Susceptibility

That is the person's subjective perceptions of the likelihood of experiencing a specific disease or condition that would adversely affect their health risk. For the behavior of seeking health advice and medication, pregnant women must believe that they can be diagnosed with pre-eclampsia which can be reduced/stabilized. This constellation of belief is referred to as "belief in susceptibility".

ii. Perceived Severity or Perceived Seriousness

It is the person's perceptions regarding the effects of the disease or condition might have. For this case, it is pregnant women perceptions towards the effect of pre-eclampsia.

iii. Perceived Benefits

That is the person's perceptions of the gains associated with adhering to preventive and management strategies of pre-eclampsia. On assessing the state of pregnancy through utilization of antenatal care services, pregnant women must believe that benefits stemming from recommended behavior outweigh the costs and inconveniences and it is indeed possible and with their grasp.

iv. Perceived Barriers

That is pregnant women perceptions of impediments associated with performing the behavior, perceived barriers explain one's belief about the tangible and psychological costs of the advised action.

v. Cues of Action

These include a diverse range of triggers such as perception of complication, social influence , health education campaigns, media reports and mass media campaigns. The hbm is beneficial in assessing health protection or disease prevention behaviours. It is also useful in organizing information about clients' views on the state of health and what factors may influence them to change their behaviour. The hbm when used appropriately provides organized assessment data about clients' abilities and motivation to change their health status. Programmes can be developed or improved to suit the needs of clients.

Fig-1. Health Belief Model
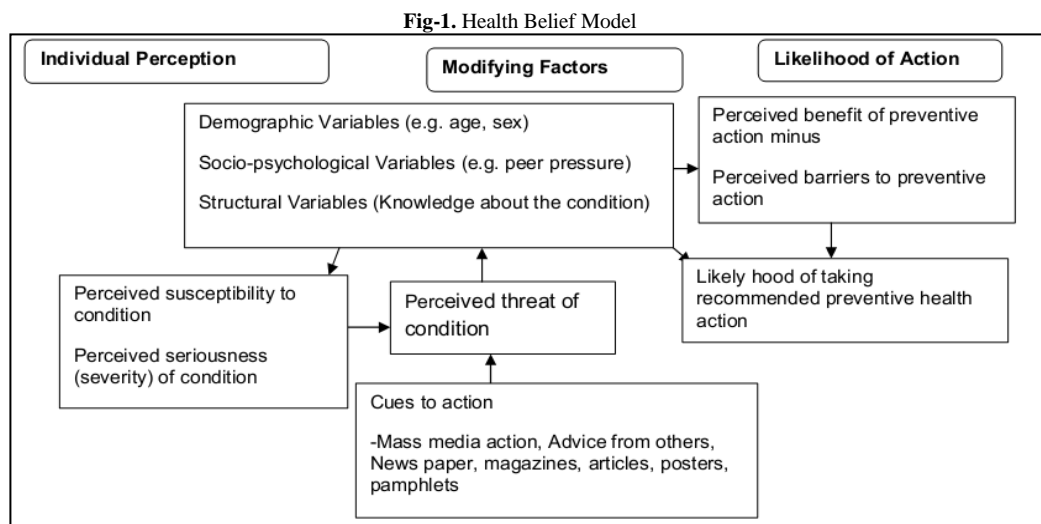
Source: Www.Wikipedia/Healthbelief Model.Html

2.3.2. Application of Model to the Study

The knowledge of preeclampsia a pregnant woman has would make it easy to maintain the good health of their babies as they would find ways to prevent pre-eclampsia in order to continue enjoying good health. When pregnant women know and believe that incidence of pre-eclampsia leads to complications that will affect their pregnancy and the foetus, they would seek ways to prevent it. Consequently, with continuous treatment their health and state of their pregnancy would not worsen to the point of death and several complications such as seizures and liver problems would be averted. Knowing the various advantages associated with preeclampsia prevention or treatment, pregnant women will extremely engage in them so as to maintain the good health and that of the foetus. However, ignorance of the advantages would lead to unfavorable health conditions leaving their pregnancy in a state of severe ill conditions which may lead to death. There will be lack of interest in utilizing health care services that would promote safe deliveries whenever pregnant women are faced with hindrances such as inadequate finances and poverty. This would lead to a reduction in good health and safe deliveries of babies. As pregnant women receive information on preeclampsia from radios, televisions and papers would build up subsequent reassurance on its management. Alternatively, if they do not receive such information from the above media, there will be a reduction in the management and outcome of preeclampsia which will make them (as well as their babies) not enjoy the benefits that come with preeclampsia management.

3. Research Method and Materials

This section focuses on the research design, research setting, research population, sample and sampling technique, instrument for data collection, method of data collection, procedure for data analysis and ethical consideration.

3.1. Research Design

The research design adopted for this study was the descriptive survey design used to assess management and outcome of preeclampsia among pregnant women in university of calabar teaching hospital (ucth), calabar, cross river state, Nigeria. According to Akpabio [27], descriptive survey design is used to reveal current conditions that exist between specific events through orderly collection, analysis, interpretation and reports of, pertinent facts and information concerning situation or an enterprise as far as conditions and circumstances permit.

3.2. Research Setting

The setting for the study is calabar and the site is university of calabar teaching hospital (ucth), calabar. Calabar is the capital of cross river state and a one-time capital of nigeria. As the first capital of nigeria, calabar remains an important city in the history of nigeria. Located on a pennisula between calabar river and the great kwa river, calabar lies between 4^o58 north of the equator and 8^o17 east of the greenwich meridian with an estimated population of about 1.293million people [28].

Calabar possesses common boundary to the south with equitorial guinea, to the east with oron local government area in akwa ibom state, to the west with akpabuyo local government area and to the north with odukpani local government area. Calabar is an island situated 87km from uyo, the capital of akwa ibom state. It is separated from nearby highland areas by rivers and broad stretches of low, wet land and mangroves swamps. Calabar is inhabited by the quas and the efiks. However, due to migration and urbanization, people from other tribes such as the ibibios, ibos, yorubas, hausa and people from other tribes now resident in the city. It is a peaceful city with tourist attractions such as marina resorts and tinapa. The people are traders, fishermen and civil servants by occupation. The main religions are christianity and traditional beliefs.

The site for the study was university of calabar teaching hospital (ucth), calabar. Ucth, calabar was established in 1979. It was formally st margaret hospital in calabar south but moved to its permanent site on february, 2012. The hospital is a tertiary health facility located in calabar municipal council area along unical hotel road by the west, bounded in the north by edim-otop community, in the east by satellite town and in the south by university of calabar (unical), calabar. It serves as a training centre for medical, nursing and paramedical personnel and also a research centre. The hospital is also made up of twenty-five (25) wards and units, with 392 beds and 118 cots, amongst which are casualty ward; diarrhoea treatment and training unit (dttu); eye ward; ear, nose and throat (ent) ward; male medical ward; male surgical ward; female medical ward; female surgical ward; paediatric medical ward; paediatric surgical ward; male orthopaedic ward; female orthopaedic ward; cardiothoracic ward; intensive care unit (icu); gynaecological ward; ante-natal ward; post-natal ward; labour ward; special care baby unit (scbu); and sick baby unit (sbu). The researcher chose the site because it was easily accessible and was known for treatment of pre-eclampsia cases.

3.3. Research Population
3.3.1. Target Population

The target population of the study consists of 550 nurses in ucth that have been involved with caring for pregnant women who registered with the anc clinic in ucth between january, 2013 and december, 2017.

3.3.2. Accessible Population

The accessible population consist of 232 nurses who had been involved with the management of pregnant women who were diagnosed with preeclampsia at the antenatal clinic of ucth, calabar between january, 2013 and december, 2017.

3.4. Sample and Sampling Technique

The sampling technique used was simple random sampling to enable the researcher select the number of pregnant women diagnosed with preeclampsia that will constitute the sample for this study. The sample size was 232 as calculated using yaro yamane's sample size formula as shown below.

$$N = \frac{N}{1+N\,(e^2)}$$

Where;

N = Sample Size

N = Population = 550

E = Level of Significance (Usually 0.05)

$$N = \frac{550}{1+550(0.05)^2}$$

$$N = \frac{550}{1+550X\,0.0025}$$

$$N = \frac{550}{1+1.3750}$$

$$N = \frac{550}{2.3750}$$

N = 231.5789

Therefore, N = 232

3.5. Instrument for Data Collection

A self-developed and structured questionnaire was used to elicit data from the respondents. The questionnaire compromise of three (3) sections designed to collect data on:

Section a: socio-demographic data of pregnant women with preeclampsia.
Section b: management of preeclampsia among pregnant women.
Section c: outcomes of preeclampsia management among pregnant women.

3.6. Validity of Instrument

Face validity and content validity of the research instrument was established by the researchers. In order to achieve this, the researchers constructed the instrument reflecting the variables under investigation. Also, the item in the instrument was based on the specific objectives, and the researcher presented it to the project supervisor for modification and certification of the instrument was valued.

3.7. Reliability of the Instrument

The reliability was done using test-retest method. Here the researchers gave ten (10) copies of the questionnaire to nurses who had been involved with management of pregnant women diagnosed of preeclampsia in general hospital, calabar who were not part of the study and collected same day. Thereafter, the same sets of questionnaires were administered to the same respondents after a week and the two tests were correlated using spearman correlation coefficient to test their significance at 0.05 level of significance was gotten.

The results were significant before it was used for the research as shown below in Table 1.

Table-1. Test re-test reliability of the management and outcome of preeclampsia among pregnant women in university of calabar teaching hospital (ucth), calabar

Variable	No of items	Testing	Mean	Standard deviation	R_{cal}
Management Of Preeclampsia	6	1st	5.63	2.75	0.8061
		2nd	5.52	1.49	
Outcome Of Preeclampsia Management	5	1st	3.41	2.71	0.7980
		2nd	3.12	2.00	

3.8. Procedure for Data Collection

The questionnaire was administered to the respondents face to face with the help of two research assistants and the same number was retrieved at the spot. Two hundred and eighty-four (197) copies of the questionnaire were administered and retrieved. The data was then analyzed.

3.9. Data Analysis

The data collected were analyzed using percentages and frequencies, while the hypothesis was tested using the chi-square statistic.

3.10. Ethical Consideration

The researchers obtained a letter of introduction from the head of department nursing science university of calabar, and submitted to the deputy director of nursing services, ucth to obtain permission for the study. The topic for the research was introduced and instructions given on how the questionnaires should be filled. The researcher reassured the participants that all information must be only for academic purpose and clients' names will not be indicated so as to maintain confidentiality and privacy. The consent of the respondents was adequately gained by giving them adequate information to enable them to express their feelings.

4. Data Analysis and Result Presentation

This chapter focuses on the results of the findings emanated from the study. The data are presented according to the research questions of the study.

4.1. Socio-Demographic Data of the Respondents N = 197

Table-2. Socio-demographic data of preeclampsia in ucth (n=197)

Variable	Frequency	Percentage
Age		
15-19years	12	6.09
20-24years	37	18.78
25-29years	52	26.40
30-34years	46	23.35
35-39years	33	16.75
40-44years	10	5.08
45-49years	7	3.55
Total	197	100
Parity		

0 – 4 Children	108	54.82
5 – 9 Children	89	45.18
Total	197	100

The result in Table 2 showed that 12(6.09%) were between 15-19years, 37(18.78%) were 20-24years, 52(26.40%) were between 25-29years, 46(23.35%) 30-34years, 33(16.75%) were between 35-39years, 10(5.08%) were between 40-44years and 7(3.55%) were between 45-49years. In terms of parity, 108(54.82%) had 0-4 children and 89(45.18%) had 5-9 children.

4.2. Results for Research Questions

This section deals with answering of the research questions directing the study. The data are presented in tables using simple percentages.

4.2.1. Research Objective One

What are the management strategies of preeclampsia among pregnant women in ucth, calabar?
The result is presented in Table 3.

Table-3. Preventive Management Strategies Of Preeclampsia At UCTH, Calabar

Preventive Management Strategies	Frequency/Percentages
Regular ANC Visits And Check-Up	197 (7.34%)
Calcium And Vitamins Supplement	197 (7.34%)
Salt Restricted Diet	197 (7.34%)
Low Dose Aspirin	197 (7.34%)
Folic Acid Supplements	197 (7.34%)

Table 3 showed that the preventive management of preeclampsia in ucth. All the 197 (7.34%) patients diagnosed with preeclampsia had carried out preventive management strategies such as; regular anc visits and check-up, calcium and vitamins supplement, salt restricted diet, low dose aspirin and folic acid supplements.

Table-3a. Nursing Management Strategies Utilized In The Care Of Preeclampsia In UCTH, Calabar

Nursing Management Strategies	Frequency/Percentages
Monitoring Of BP, Proteinuria And Edema	197 (100)
Observe For Signs Of Complication	197 (100)
Maternal And Foetal Surveillance	197 (100)
Administration Of Drugs	197 (100)

Table 3a showed that the nursing management of preeclampsia in ucth, calabar. All the 197 (100%) respondents admitted and diagnosed with preeclampsia were managed via monitoring of bp, proteinuria and edema, observation for signs of complication, maternal and foetal surveillance and administration of drugs.

Table-3b. Therapeutic Management Strategies Of Preeclampsia At UCTH, Calabar

Therapeutic Management Strategies	Frequency/Percentages
Magnesium Sulphate	197 (100%)
Hydralazine	84 (42.64%)
Labetalol	67 (34.01%)
Nifedipine	46 (23.35%)

Table 3b showed the therapeutic management of preeclampsia in ucth. All the 197 (100%) patients who attended maternity unit with diagnosis of preeclampsia were treated via magnesium sulphate. Also, 84(42.64%) were treated with hydralazine, 67(34.01%) were treated with labetalol and 46(23.35%) were treated nifedipine.

4.2.2. Research Question Two

What is the outcome of preeclampsia among pregnant women in maternity unit of ucth, Calabar?
The result obtained from the data received is presented in table 4.2.3.

Table-4. Outcome of Preeclampsia at UCTH, Calabar

Year	Outcome			Total
	Recovered	Complication	Deaths	
Jan - Dec, 2013	23 (11.68%)	11 (5.58%)	4 (2.03%)	38 (19.29%)
Jan - Dec, 2014	18 (9.14%)	8 (4.06%)	3 (1.52%)	29 (14.72%)
Jan - Dec, 2015	25 (12.69%)	4 (2.03%)	5 (2.54%)	34 (17.26%)
Jan - Dec, 2016	42 (21.32%)	11 (5.58%)	2 (1.02%)	55 (27.92%
Jan - Dec, 2017	29 (14.71%)	6 (3.05%)	6 (3.05%)	41 (20.81%)
Total	137 (38.49%)	40 (20.30%)	20 (10.15%)	197 (100%)

Table 4 showed the outcome of preeclampsia in university of calabar teaching hospital, calabar. Between january – december, 2013, 23(11.68%) patients recovered, 11(5.58%) had complications and 4(2.03%) died. Between january – december, 2014, 18(9.14%) patients recovered, 8(4.06%) had complications and 3(1.52%) died. Between january – december, 2015, 25(12.69%) patients recovered, 4(2.03%) had complications and 5(2.54%) died. Between january – december, 2016, 42(21.32%) patients recovered, 11 (5.58%) patients had complications, and 2(1.02%) patients died. Between january – december, 2017, 29(14.71%) patients recovered, 6(3.05%) had complications and 6(3.05%) died after being treated and managed. Consequently, out of the 197 cases diagnosed with preeclampsia, 137(38.49%) patients recovered, 40(20.30%) had complications after being managed, and 20(10.15%) died after the treatment and management strategies were carried out.

4.3. Hypothesis Testing

There is no significant association between management of preeclampsia and outcome of preeclampsia among pregnant women in maternity unit of ucth, calabar.

By application of chi-square test, the table below was obtained.

Table-5. Association between management of preeclampsia and outcome of preeclampsia among pregnant women in maternity unit of ucth, calabar

Management Of Preeclampsia	Outcome			Total	Df	X^2_{cal}	X^2_{crit}
	Recovered	Complications	Death				
Hydralazine	48	30	6	84			
Labetalol	55	4	8	67	*4*	*22.3281*	*9.4877*
Nifedipine	34	6	6	46			
Total	137	40	20	197			

0.05 level of significance, df= (c-1(r-1)= (3-1)(3-1)= 4, critical value= 9.49, calculated value= 22.33

4.4. Decision Rule

If $X^2_{cal}> X^2_{crit}$, *Reject H$_0$,* Otherwise, Accept H$_0$

4.5. Conclusion

Since the x^2-*calculated value* (**22.33**) is greater than the x^2-*critical value* (**9.49**), the researchers rejected the hypotheses which stated that there is no significant association between management of preeclampsia and outcome of preeclampsia among pregnant women in maternity unit of ucth, calabar. This implies that management of preeclampsia influences outcome of preeclampsia among pregnant women in maternity unit of ucth, calabar. Therefore, if the factors associated with the patient's opinion are favourable, the opinions of a patient concerning the management of hypertension will be positively inclined.

5. Discussion of Findings, Summary, Conclusion and Recommendations
5.1. Discussion of Findings

This study discusses the major findings of the research in relations to the research objectives. The purpose of the study was to determine the prevalence management and outcome of preeclampsia among women in maternity unit of university of calabar teaching hospital, calabar from january, 2013-december, 2017.

5.1.1. Management Strategies of Preeclampsia Among Pregnant Women

The findings from the study revealed that the management strategies of preeclampsia that was carried out in ucth, calabar include; preventive management, nursing management and therapeutic management. Results revealed that all respondents were managed with the following preventive management strategy; regular anc visits and check-up, calcium and vitamins supplement, salt restricted diet, low dose of aspirin and folic acid supplements. It was obtained that the nursing management strategy utilized for managing preeclampsia are; monitoring of bp, proteinuria and edema, observation for signs of complication, maternal and foetal surveillance and administration of drugs. It was discovered that majority of the respondents were treated with labetalol as a therapeutic management strategy. The above finding is at par with the study by Cetin and Huppertz [29], who opined that preeclampsia cases should be managed by magnesium sulfate and lorazepam and phenytoin amongst many other drugs.

5.1.2. Outcome of Preeclampsia Among Pregnant Women

Results obtained from this study revealed that the outcome of preeclampsia is good showing that 21.32% recovered for the period of the study, 5.58% had complications and 1.02% died. The rate of the death from preeclampsia in ucth, calabar is slightly higher than that reported in studies from mozambique and zimbabwe, which reported a death rate of 7.3% and 6.9% respectively Adinma [17]. This is in line with the study by Oyira [13], who reported a 24% death rate over a period of 6years. This corroborates with the findings of Meher, *et al.* [30] who opined that pre-eclampsia has been a major challenge to obstetrics practice, which is a common complication of pregnancy associated with high maternal and perinatal morbidity and mortality especially in developing countries.

5.1.3. Hypotheses Testing

The findings in this study showed there is a significant relationship between management of preeclampsia and outcome of preeclampsia among pregnant women in maternity unit of ucth, calabar. This is in line with Adinma [17] who reported in a study that there was a significant relationship between management and outcome of preeclampsia.

5.2. Summary of the Study

A retrospective research was carried out to elicit the management and outcome of preeclampsia among women in maternity unit of university of calabar teaching hospital, calabar between january, 2013 and december, 2017. This study was brought about due to prevalence of preeclampsia and its associated complications. Three (3) specific objectives were to determine prevalence of preeclampsia, the treatment regimen utilized in management of preeclampsia and the outcome of preeclampsia among pregnant women in maternity unit of ucth.

The sample size was 197 charts of pregnant women suffering from preeclampsia. Data was extracted through the use of checklist, no sampling technique was used. The instrument was validated by the researchers who checked for face validity. Data was collected by reviewing records and folders of pregnant women that were diagnosed of preeclampsia.

The result revealed that the prevalence of preeclampsia from january, 2013 – december, 2017 was 7.34%. Based on the above, conclusion was drawn and recommendations were made.

5.3. Conclusion

From the findings of this study, it shows that the rate of preeclampsia in ucth, calabar is increasing. This is a challenge to obstetrics and midwifery because if not well managed, this condition would result in maternal mortality. It therefore, requires close supervision of the health of pregnant women in the antenatal period to elicit early diagnosis and treatment.

5.4. Implication to Nursing

Findings of this study therefore become very relevant to nurses and midwives to create awareness to mothers on prevention, early recognition and important of hospital delivery. This may significantly reduce complications and associated morbidity and mortality due to preeclampsia.

5.5. Recommendation

Based on the findings from this study, the following recommendations were made;
- Effective and sustained health education of mothers on the need for early booking, regular antenatal supervision of pregnancy and child birth in appropriate health facility as well as on identification of early signs of preeclampsia is necessary
- Regular training workshops and seminars for midwives, medical practitioners and other relevant health workers on preeclampsia and the current advances in its management.

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