OUTCOME OF REMINDER CALLS AND HOME VISITS ON ANTENATAL CARE ADHERENCE AND UTILISATION OF DELIVERY SERVICES IN PRIMARY HEALTH CENTRES IN LAGOS STATE

BY

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ABSTRACT

Inadequate access and under-utilisation of modern healthcare services have been identified as major reasons for increased maternal morbidity and mortality in developing countries. In Nigeria, maternal mortality rate at 2017 was estimated to be 821 per 100,000 live births. In 2017, only 11.07% of the women that registered for Antenatal Care (ANC) delivered at the Primary Health Centres (PHCs) in Lagos state. Health education, reminder calls and home visits have been recognised as important interventions in preventing maternal morbidity and mortality; but there is scarcity of data regarding the effectiveness of these intervention among women attending PHCs in Lagos rural communities. Hence, this study was designed to evaluate the outcome of health education, reminder calls and home visits onadherence to ANC andUtilisation of Delivery Services (UDS) in PHCs in Lagos state.

A quasi-experimental study was conducted in twelve randomly selected Comprehensive /Midwifery Service Scheme (MSS) PHCs in Lagos state. Intervention-Group (IG) PHCs were 3 from Ikorodu and 3 from Epe towns while 6 PHCs from Badagry town served as Control-Group (CG). A total of 280 pregnant women in their first trimester, 152 in the IG and 128 in the CG participated in the study lasting 28 weeks. Systematic random sampling was used for selection of respondents. Health education was given every fortnight using the module (importance of ANC and delivery services in PHCs), 58 reminder calls and 42 home visits were made to the participants in IG who did not attend regularly while CG received routine ANC. Adherence to ANC (regular ANC attendance, having received required tetanus toxoid, intermittent preventive treatment for malaria and antihelminthics) was assessed at 16^{th} week (baseline) and 36^{th} week, adopting Morisky Adherence Treatment Scale (MMAS-7), reliability (r) = 0.7603, with maximum score taken as 100%. Intention for UDS was assessed at baseline while actual UDS (delivery at the PHCs) was assessed after childbirth. Data were analysed using independent t-test, Chi-square test and multiple regression at $\alpha^{0.05}$.

Participants in IG and CG had mean age of 26.90±4.39 and 25.99±4.28 years, respectively. Adherence to ANC at 16^{th} week was higher in CG compared to IG; IG = 39(26.4%), CG = 43(33.6%). At 36^{th} week, high level of significant improvement in adherence was observed in IG compared to CG, IG =121(79.6%), CG =53(41.4%). Inter groups adherence to ANC at baseline, IG = 3.68±1.16; CG =3.98±1.26, while at post intervention, there was a significant difference in IG = 5.36±1.12; compared to CG = 4.13±1.39. At baseline, participants' score for intention for UDS was IG = 85 (54.4%); CG = 50(39.1%) while at the end of pregnancy, actual UDS for IG = 122(82.4%), CG 73(59.0%), thereby indicating positive effect of the interventions. Age (OR = 0.48, CI = 0.14-1.70), occupation (OR = 3.68, CI = 0.38-35.46) and income (OR = 1.25, CI = 0.14 - 10.89), were not significantly associated with ANC adherence.

Health education, reminder calls and home visits improved pregnant women's adherence to antenatal care and utilisation of delivery services.

Keywords: Antenatal care, adherence, Home visits, Reminder calls, Birth services
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Ogechi Helen Abazie

CERTIFICATION

This work was carried out by Ogechi H Abazie in Nursing Department, Faculty of Clinical Sciences, University of Ibadan

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DEDICATION

I dedicated this work to my husband Mr G. N Abazie and my parents Sir and Lady L.I Abanonu.

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CHAPTER ONE

1.0Introduction

1.1 StudyBackground

In developing countries, non-adherence to antenatal care and utilization of skilled birth services is a major cause of increased maternal mobility and mortality (WHO, 2016). The essence of antenatal care (ANC) is to prepare women for birth, parenthood and prevent problems for pregnant women, mothers and babies through early detection, alleviation and or management of health problems that affect mothers and babies during pregnancy(Adeniyi and Erhabor, 2015).Antenatal care (ANC) can be defined as the care provided by skilled health-care professionals to pregnant women and adolescent girls in order to ensure the best health conditions for both mother and baby during pregnancy. The components of ANC include: risk identification; prevention and management of pregnancy-related or concurrent diseases; health education and health promotion (WHO, 2016).

However, despite the explained benefits of early and frequent ANC visits to increase the likelihood of early prevention, detection, and treatment of potential pregnancy complications (Kanyangarara, Munos and Walker, 2017),majority of pregnant women in developing countries do not adhere to ANC. It is of note that complications that may arise from pregnancy are impossible to predict. The World Health Organization (WHO) therefore recommends delivery by a skilled birth attendant (SBA) (Boah1, Mahama and Ayamga1, 2018). The presence of an SBA at delivery has also been stressed in many summits and international conferences worldwide. The contribution of skilled delivery in the reduction of deaths among pregnant women and neonates has been highlighted by several studies including(Boah, Mahama and Ayamga, 2018).According to WHO (2016),ANC is theonly opportunity to support and provide information to pregnant women.To adhere to ANCcomprise of a lot which includes, a healthy routine,intake of adequate nutrition; preventionand early detection of diseases; advise on family planning and support for women who may be facing intimate partner violence. Identification and treatment of problemslike pre-eclampsia, tetanus toxoid immunisation, malaria intermittent prevention during pregnancy(IPTp), identification and infections management, like HIV, syphilis and other sexually transmitted infections (STIs),are essential interventions in ANC. During ANC the women are

encouraged to use professionals at birth and to engage in healthy activitieslike breastfeeding, early postnatal care, and planning for optimal pregnancy spacing (WHO, 2016).

Compliance with ANC varies from region to region, ethnic group to ethnic group, from state to state and local government to local government. Antenatal care adherence and skilled delivery utilisation is still not adequate in Nigeria. Three-fifths of mothers according to National Population Commission and ICF International (2014) were reported to have consulted professionals- a doctor, nurse, midwife, or auxiliary midwife at least once for ANCfor their birth in the five-year duration before the survey.Exclusive use of faith based and traditional ANC, low education, low economic status, and dwelling in the villages were main factors associated with risk for overall irregular ANC use(NPC and ICF International, 2014).

Despite decades of implementation of maternity healthcare programmes, including a focus on increasing the use of antenatal care (ANC) and concomitant birth preparedness and complication readiness (BPCR), the uptake of ANC continues to be below expectations in many developing countries. This has attendant implications for maternal and infant morbidity and mortality rates. Known barriers to ANC use include cost, distance to health care services and forces of various socio-cultural beliefs and practices (Sumankuuro, Crocket and Wang, 2017). Majority of mothers in low income countries do not receive skilled health care during pregnancy. Under-utilisation and poor access to modern healthcare facilities were the major reasons for poor maternal health in the developing counties. It have been proved that antenatal care (ANC) is an important element of safe delivery everywhere. Antenatal care should be a priority program in all developing countries, where problems during pregnancy and childbirth are the primary cause of death and disability among women of reproductive age (WHO, 2018).

According to (WHO, 2016), problems associated with pregnancy are reduced with regular interaction between women and adolescent girls at ANC with skilled health care provider in the health system.When ANCservices are accessed during the first trimester of pregnancythe benefitsaremore effective. Detection and managementof potential problems at the early stage, is possible during ANC.In relation to ANC, the number of visits, timing of visits and service contents of visitsgenerally differ among countries(Akanbiemu, Manuwa-Olumide, Fagbamigbeand, Adebowale, 2013).

In Nigeria,821 per 100,000 live birthsis still estimated maternal mortality rate (MMR).Thesedeaths took place becauseof pregnancy, delivery and post-delivery problemsevery year. It is mainly due to underutilisation of ANC and delivery services(CIA world factbook,2018). The MMR of any country is apointerof its maternal health and well-being. The government health sector policies'sintension is toadvanceoverallhealth of the Nigerian population especially that of the women (National Population Commission and ICF, 2014).

Thrity-three percent out of thrity five percent of births were conducted by professionals in health facilities(NPC and ICF, 2014).This indicatesthe need to continuously teach the pregnant women the reason adherence to ANC and utilisation of delivery services in PHCs are needed. The women that will deliver in health facilities (with skilled attendance) will increase and it will also reduce maternal morbidity and mortality.Decreasing the global MMR to less than 70 per 100 000 births, with no country having a MMR of more than twice the global average,is the focus of sustainable development goal 3 (WHO, 2016).Failure to attend maternal health services is an intractable challenge for the health-care system in low- and middle-income countries.

The use of technology for reminding patients about their appointments has been demonstrated to be an effective (future) tool toward increased health care services utilization in developing countries,Nurses and Midwives are to educate, and follow up pregnant women during ANC toincreasetheirknowledge for better adaptation to the pregnancychanges and the benefit of delivery with SBA.Health educationis oftenverbal andincludesmedical terms,somostmothers cannotperceive information from itandmost information areunusable.Althoughgivinginformationduring pregnancyis essentialbutthe mostimportantfactoristherateofperception, comprehensionandtheabilitytouseinformationindangerous andinevitable situations.

Researchers have explored the use of mobile phone reminders to improve adherence to ANC and delivery services (Pai1, Supe, Kore, Nandanwar, Hegde, Cutrell1 and Thie, 2013). A combination of reminder calls, home visits and health education during ANC could berecognised asimportant interventional stepsin preventing illness and death during pregnancy, delivery and after birth. Pregnant women receiving ANC at health care facilities should be regularly followed up for investigations, to intensive life support during pregnancy and up to delivery. Also, the

greatest purpose of antenatal care is to suggest health information and services that can meaningfully advance the health of mothers and their infants after pregnancy. Thus, pregnant women could adhere to ANC and utilise delivery services at the PHCs when reminder calls and home visits are used with health education.

1.2 Statement of Problem

In some developing countries, many expectant mothers had no knowledge of the benefits they would derive from utilising skilled maternity care; this lack of health literacy, combined with mockery, shame and stigmatisation from the family and community if they sought ANC, resulted in the absence of ANC uptake. In some communities in Sub-Sahara,the expectant mothers have to gain approval from their husband (and in some locations, permission from the community) before seeking ANC at a health facility and a man accompanying the wife to ANC was seen as a violation of cultural norms. In these locations, expectant mothers could register for ANC but fail to follow-up or implement therapeutic interventions, and preference for home birth took precedence over ANC(Sumankuuro, Crocket and Wang, 2017).

Profound barriers to ANC utilisation continue to exist in many locations due to the interactions of socioeconomic influences (such as accessibility, cost), health service-related factors (such as lack of trained staff and other resources) and a diverse array of cultural beliefs and practices(Sumankuuro, Crocket, and Wang, 2017).A high proportion of women in developing countries are reported to have received antenatal care (ANC) at least once from a qualified health provider during pregnancy (Boah, Mahama and Ayamga, 2018). However, in spite of the importance placed on the use of an SBA by women during delivery to prevent complications, it is not uncommon to find one in three women using an SBA during delivery, especially in Sub-Sahara Africa. Cost, number of ANC visits made by a woman before delivery, maternal education, poor attitude of health care providers, parity and distance, the effect of which is compounded by the lack of transport in our rural communities, have been identified as some barriers to the use of health facility by pregnant women for delivery in developing countries (Boah, Mahama and Ayamga, 2018).

However, despite the explained benefits of early and frequent ANC visits to increase the likelihood of early prevention, detection, and treatment of potential pregnancy complications, the

proportion of pregnant women beginning ANC in their first trimester, those who complete ANC visits, and births assisted by skilled providers are still unsatisfactory in Nigeria (NPC and ICFI, 2014).The number of pregnant women receiving ANCfrom professionals increased from 58% in 2003 to 61% in 2013 (NPC and ICF, 2014). Also in Nigeria, NPC and ICF (2014), observe that 77% of women in the rural areas will possibly deliver at home. The high mortality rate is due to delay in decision to comply with ANC by pregnant women due to poverty and ignorance. This number is still on the decrease when compared with the number of mothers receiving ANC in some developing countries.

The reduction program on maternal and child mortality in Lagos Statehas contributed to a rise in utilisation of the primary health care centres but there is a wide gap between the number of women who come for ANC and the women that use the facilities for delivery. However, figures show that inLagos State,only 11.07% of the women that register for ANC, deliver at the primary health centres (Lagos State Ministry of Health, 2017).The researcher has seen many women that registered for ANC atrural primary health centers in Lagos State who did not complete their ANC nor gave birth in the facilities but later came with their babies for immunisation. They admitted giving birth at mission homes, and in the homes of traditional birth attendants (TBAs). Studies by Wagnew, Dessie, Alebel, Mulugeta, Belay and Abajobir (2018),Yaya, Bishwajit and Ekholuenetale (2017),Muluwas, Muluemebet and Misra (2015),Adewoye, Musa, Atoyebi, and Babatunde (2013)have sought causes and effects of adherence with ANC,utilisation of delivery services and the use of reminder calls, but home visitsto the pregnant women is an additional intervention in the current study. Also, to find out from them what they perceived to be the problem and why they prefer TBAs and religious homes to health setting. This study assessed the outcome of reminder calls and home visits on adherence to ANC and utilisation of delivery services in PHCs in Lagos state.

1.3Research Questions

1.What isthe knowledge ofpregnant women on maternity care pre and post intervention?

2.What are the pregnant women's perceived benefits of adherence to maternity carepre and post intervention?

3. What are the perceived barriers of adherence to maternity carepre and post intervention?

4. What is the pregnant women'slevel of adherence to ANCpre and post intervention?
5.What is thepregnant women'slevel of utilisation of delivery services pre and post intervention?

1.4 Broad Objective

To assess the outcome of reminder calls and home visits onANC adherence and utilisation of delivery services in primary health centers in Lagos State.

1.5 The specific objectives of this study were to;

1. assess the knowledge of maternity care among pregnant women pre and post intervention.
2. assess the pregnant women's perceived benefits of adherence to ANC and utilisation of delivery services pre and post intervention
3. identify the pregnant women's perceived barriers to adherence to ANC and utilising delivery services pre and post intervention
4. examine pregnant women'slevel of adherence to ANC pre and post intervention.
5. examine pregnant women'sintention to utilise the delivery services and their utilisation of delivery services pre and post intervention.

1.6 Significance of the study

This study increased the knowledge of pregnant women in the selected PHCs on ANC and delivery services. Results from this research could be used in other primary health centers to ensure adherence to ANC and utilisation ofdelivery services by pregnant women. Reports could be made available to primary health care policy makers so that it can be used in makingpolicy on improving adherence to ANC and delivery services in the PHC.The findingswill contribute to the formulation of specific guidelines on ANC and birth services in primary health centers in Lagos State.

This studyidentified various factors that influence adherence toANC and utilisation of birth services in PHCs.Findings from this studyprovided basis for further research especially in areas where results on adherence to ANC and utilisation of delivery services are not definite.

1.7 Operational Definitions

Reminder calls: Phone calls and text messages(SMS) to the intervention participants before ANC services

Home visits: Visits to the homes of defulting participants before ANC.

Utilisation: Theparticipants' deliveryof their baby with a skilled health provider in selected PHCs.

Antenatal care: Relating to the services provided to pregnant women, during pregnancy and birth, in selected PHCs.

Adherence: This is the compliance of the pregnant women with required ANC regimen in the selected PHCs.

Delivery services: The attention given to a pregnant woman duringchild birth in the selected PHCsby skilled health workers.

Skilled Health Workers: Midwives, Nurses, Medical Officers, CHEW, working at the selected PHCs who were trained and certified by their professional bodies to provide care to pargnant women during ANC and child birth.

CHAPTER TWO

2.0 Literature Review

This chapter presents the conceptual and empirical reviews as well as the theoretical framework and hypotheses.

2.1 Antenatal CareConcept

The carethe midwives, nurses, and sometimes a doctor who specialises in pregnancy and child birth,gives to pregnant women during pregnancy through a series of consultationis called antenatal care (ANC),(NPC and ICF, 2014). The recent World Health Statistics according to an analytical review displayed that ANC report, between 2006 and 2013, was correlated with maternal mortality ratio (MMR) worldwide. Antenatal care involves regular visits to a midwife or doctor, who examines the pregnant woman and determines fetal growth and wellbeing, alsoto detect disease or potential problems (Admi, 2014).

It have been observed that an important point of contact between health workers and the pregnant womenis at ANC,it also invole health educationfor the pregnant women, detection pregnancy problems, and a birth plan to make sure of skilled birth.Health education during ANCpreparespregnant women to makedecisions duringpregnancy and childbirth. In sub-Saharan Africa (SSA), the number of pregnant women seeking ANCservices, sometimesoverwhelm thehealth care workers. Most pregnant women who utilise ANCat the end do not receive adequate attention, from professionals(NPC and ICF International, 2014).

The World Health Organisation's new antenatal care modelhas been increased from four to eight for all pregnant woman. This will decrease the possiblity of problems encountered among women andadolescent girls during pregnancy. Also,potential problems can be detected and managed. There is reductionin the death of women by 8 per 1000 births with at least eight contacts during ANC when related to at least four visits.

World Health Organisation's eight contacts conceptfor ANC encourage contacts among health providers and pregnant women, it increases the number of assessments on mother and fetusto detect problems, and the probability of optimistic pregnancy outcomes. Thepregnant women

contact ANC in the first trimester (0-12 week's gestation), thefollowing visits take place at 20, 26, 30, 34,36, 38 and 40 weeks' of gestation (WHO, 2016).During each visit to the health facility for ANC, the pregnant women should receive care according to the new guidelinesby WHO.It contains 49 recommendations,which include the importance of adquate food and best nutrition, physical activity in pregnancy, effect of tobacco and substance use on mother and baby;prevention of malaria and HIV; blood tests and immunisation e.g. tetanus vaccination; fetal size including use of ultrasound; and advice for dealing with common physiological symptoms such as nausea, back pain and constipation. These will help the pregnant womenand the developing babies stay fit through pregnancy and after birth (WHO, 2016). The health care provider's contact with the pregnant womanat ANC should be for the provision of care and support throughout pregnancy.

Recommendations for the new concept include:

- Antenatal care concept with at least eight visits suggested decrease in death of womenduring pregnancy, child birth and help in developing their experience of care.
- Therapy on adequate diet, also on being physically active during pregnancy.
- Preventingthe pregnant woman from developing anaemia, puerperal sepsis, the fetus from low birth weight, and preterm birth, supplementation on oral iron and folic acid is to be taken daily. The recommendations for every pregnant woman are 30 mg to 60 mg of elemental iron and 400 μg (0.4 mg) folic acid.
- Preventing maternal and neonataldeath from tetanus,immunisation with tetanus toxoid is suggested for all pregnant women, depending on previous tetanus vaccination exposure.
- Ensuring accurate estimation of gestational age, improving detection of fetal anomalies and multiple pregnancies, reducing induction of labour for post-term pregnancy, and improving a woman's pregnancy experience,one ultrasound scan is suggested for all pregnant womenbefore 24 weeks' gestation.
- The pregnant women history on the use of alcohol and other substances (past and present) should be asked and recordedas early as possible in pregnancy and at every antenatal visit (WHO, 2016).

2.2 Historical overview of antenatal care

In 1900, United States introduced organised antenatal care, by social reformers and nurses (Brown, Sohani, Khan, Lilford, and Mukhwana 2008). According to Williams, (1915) cited in Ekabua, Ekabuaand Njoku, (2011), fetal mortality was reduced by 40%with ANC. According to Thomas, (2011),for improved maternal health the most vital factor in the 1950s, was ANC. Seventy five percent (75%) of American women, by the 1980s, began ANC during their first trimester(Ekabua, Ekabua,and Njoku, 2011). The year 2000 goal was that at least 90% of American pregnant women will begin ANC in their first trimester(Brown, Sohani, Khan, Lilford and Mukhwana,2008).Department of Health and Human Servicesdeveloped the content of ANC, which was reviewed by expert panel convened in 1986(Ekabua, Ekabuaand Njoku, 2011). Preconception care as an integral part of ANC,was the panel recommendation, because health before pregnancy,should determine health care during pregnancy(Brown, Sohani, Khan, Lilford and Mukhwana, 2008).

In 1900 by the efforts of James Ballantyne,in England,similar movement also began likethe ANC development in the United States(Ekabua, Ekabuaand Njoku, 2011). In those years,at Cal State Los Angeles foundation program in Southern California for training nurse practitioners was established and after graduation, they were employed to work under supervision supporting the doctors with prenatal care.

Lawson and Stewart‘s ground breaking effort, in setting up organised maternity services in the 1950s and 60 s in Nigeria,was credible. However, there was a paradigm shift in the 1990s,with no confidencefor the organised maternity system and growing support of spiritual churches and unorthodox health facilities(Ekabua, Ekabuaand Njoku,2011).

2.3 Antenatal Care:Global View

The World Health Organization recommended ANC because it is an individualised intervention that is efficacious. ANC is the best management for all pregnant women world-wide. There are poor indications and directions in relation to perfect packaging of individual interventions and delivery mechanism(s). Despite increases in ANC coverage globally,there is still inadquate improvements in maternal, fetal and newborn outcomes, in addition toinconsistent and poorly delivered care (Erica,2014).

At least for the four times recommened ANC, within 2006–2013, about 56% of pregnant women complied(WHO, 2014). The number of pregnant women who attended a miniumum of four ANCvisits,in low-income countries, improved from 37% in 1990 to about 52% in 2012. However, only 38% of pregnant women complied with four visits or more during ANC in 2006-2013. Data for all countries on the number of women who attended a minimum of four times ANC were not accessible. Obtainable information show there has been slight development in this pointer in the previous decade. The pointer did not show the quality of care given. It is noted that fifty percent women in low- and middle-income countries (LMICs) did not receive satisfactory ANC(Finlayson, 2013).

One thousand two hundred and thrity nine pregnant women from 15 countries (Bangladesh, Benin, Cambodia, Gambia, India, Indonesia, Kenya, Lebanon, Mexico, Mozambique, Nepal, Pakistan, South Africa, Tanzania, and Uganda) identified three main themes on ANC(Finlayson, 2013). The first,“Pregnancy as socially contingent and physiologically healthy” reflects women's views, they have no reasons to visit health professionals when they perceived no risk to their well-being, since pregnancy to them is a healthy state.The second “resource use and survival in conditions of extreme poverty.” This narrates the pregnant women's restricted financial income, even when ANC was accessible for free, the cost of getting to the PHC, the loss of earnings related to the visit, and the likelihood of having to pay for drugs meant that women were incapable to attend ANC (Finlayson, 2013). Third theme the researchers recognised connected to women's opinionis thatANC services were insufficient and that the welfare of attending did not offset somepossible harms. For example, pregnant women who originally identfied the welfare of ANC were often disatisfiedand they decided not to return because of lack of resources they discovered when they got there.

This theme was called “not getting it right the first time.” There should be misunderstanding among the values that reinforced the provision of ANC and the principles and socio-economic contexts of pregnant women in LMICs, which denote that unless the pregnant women’s views and concerns are addressedeven high-quality ANC may not be utilised(Finlayson,2013).The new method to the project and delivery of ANCcan be developed from thesethemes identified in this meta-synthesis. It could provide the basis for making resource availableand improve the beliefs and values of the pregnant women. That type of agenda should help confirm that ANCchanges

pregnant women's prospects, manages them appropately so that they will regularly adher to ANC.

In Nigeria,it was reported that about 61%of pregnant mothers have access to ahealth professional—amidwife, nurse, orauxiliarymidwife or doctor —atleastonceforANCfor the most presentbirth in the five-year period before the study (NPC and ICF, 2014).During this period, it is importantthat a professional provides ANC during gestation, and aid to decrease danger for the mother and child. When the mother is literate, there is a likelihood that she has seen a skilled health providerforcareduringpregnancy.About 97 % of pregnant womenwith more than secondary education have the highest adherence toANC and while adherence is lowest among womenwith no education, about 36 %(NPC and ICF, 2014).

2.4Preconception Care

According to WHO, (2013)the mother and child health outcomesare positively affected by preconception care. Ensuring universal access to preconception caremeans that many administrative divisions and invectors needs to be contactered. Preconception care is all about the delivery of bio-medical, behavioural and social health interventions to women and couplesbefore conception occurs. The vital goal of preconception care is the reduction in behaviours, individual and environmental factors that can lead to poor maternal and child health outcomes, also improving maternal and child health, in both the short and long term (WHO, 2013). Disease prevention and control that occur at several stages of life is part of preconception care. It contributes to robust public health packages that utilise a life-course viewpiontfrom infancy through childhood and adolescence to adulthood. Preconception care brings health walfare to the adolescents, women and men, regardless of their plans to become parents, which is an addition to the primarygoalof making better maternal and child health.It includes helping in assessment and identification of:

- Nutritional status: food fortification or supplementation with micronutrients such as iron, iodine and folic acid;
- Previous medical conditions: like obesity, diabetes, epilepsy, hypothyroidism and hypertensiontreatment;

- Infectious diseases: investigations, HIV/AIDS and other STIs;vaccination against rubella, varicella, hepatitis B;
- Family planning or appropriately timed pregnancies;
- Genetic disorders: preconception counselingand genetic risk assessment to decrease the risk of birth defects (Ibid, 2013).

Ideally, before one gets pregnantpreconception care should start.While planning a pregnancy, the couple should see the health professional for a complete check-up. Regular testing can make sure that one is healthy and there is no illness or other conditions that could disturb pregnancy. Unusual symptoms are reported during this period.Protracted conditions, like diabetes, asthma, hypertension (high blood pressure), a heart problem, allergies, lupus (an inflammatory disorder that can affect several body systems), depression, or some other condition, and how they could affect pregnancy, are reported(The Nemours Foundation, 2013).

During thefirst trimester (12 weeks),there may be need to change or eliminate medications to reduce risk to the fetus in some women. About managing the conditionthere may be need to be more vigilant, e.g,before trying to conceive and during pregnancy.Known diabetic women must keep their blood glucose levels under control. Birth defects and othercomplications will result when there is irregular increase in the blood glucose (The Nemours Foundation, 2013).Drinking alcohol or smoking are behaviours that can cause a risk to the baby, suchshould be avoided. During this period food that contains folic acid,vitamins, calcium, and iron are vital.It is important for women who are planning to become pregnantto take adequate food with folic acidsince neural tube defects (problems with the normal development of the spine and nervous system) happenbefore a woman even knows she is pregnant, in the first 28 days of gestation. Before considering pregnancy for the couples, genetic testing may be advisablein cases of significant genetic disorderin the woman's family history.

The practice of preconception care does not exist in developing countries (Ezugwu, Agu, Nwoke and Ezugwu, 2014). In developing countries,all policy makers in maternal and child health,are involved in vigorous, targeted and sustained female education to improve knowledge and utilisation of preconception care by women of reproductive age. Development and

maintaininguseful,devoted and multidisciplinary clinics for preconception care willreduce perinatal and maternal mortality.Before conception,preconceptual careis needed because it will aid to correct inadequate education and identify a high level of existing illness related to pregnancy in developing countries like Nigeria.

Health Problems that affect Gestation

Asthma: There may be increase preeclampsia riskif asthma is poorly controlled.Also, it can lead to fetal poor weight gain, preterm birth, cesarean birth, and other problems.Non compliance to drugs can make mild asthma to become severein a pregnant woman.

Depression: If depressioncontinues during pregnancy,it will be difficult for a woman to care for herself and her unborn baby. In case of postpartum depression,one of the danger sign is depression before pregnancy(women's health, 2017).

Diabetes: Diabeticlong-term complications will be worsened if there is increased blood glucose (sugar) during pregnancy, this can harm the fetus. It is recommened to get diabetes under control within three to six months before trying to get pregnant.

Eating disorders: During pregnancyeating disorders is worsened.This can causebody image changes. Birth defects and premature birthare pregnancy complicationslinked to the problem. Also, there is higher rates of postpartum depressionamong women with eating disorders.

Seizure disorders (Epilepsy): There is increased risk of miscarriage or stillbirth.Itcan also harm the fetus. Birth defects to the baby can be caused byusing drugs for the regulation of seizures. Using drugs causes less health risk to the epilepstic pregnant women, and the health of their babies than stopping drugs, (women's health,2017).

Hypertension (Elevated blood pressure): The pregnant woman and her babyare effected by chronic high blood pressure. Preeclampsia and placental abruption (when the placenta separates from the wall of the uterus) can occur in a woman with elevated BP. It is observed that such women have higher rate of preterm birth and low birth weight (women's health, 2017).

HIV: During pregnancy or delivery,mother to child transmission of HIV can occur. The risk is less than 1 percent if a woman is on HIV drugs during pregnancy. Before conception, a woman

living with HIV should consult herdoctor. A baby can be protectedfrom HIV and kept healthythrough good prenatal care.

Migraine: In pregnancy, there is an improvement in migraine symptoms. Most women have no migraine attacks during pregnancy. During pregnancy,some drugs usually used to treat headaches should not be used. The doctor should be consulted about ways to relieve migraine symptoms safely in a pregnant woman.

Obesityand Overweight: According to current researches,the bigger a woman is before conceptionthe greater her risk of a range of pregnancy problems, including preeclampsia and preterm delivery. Obesedor overweight women who lose weight before pregnancyhave healthier pregnancies.

Sexually transmitted infections (STIs): These maycauseearly rupture of membrane,can cause early labor and post delivery infections in the uterus. During pregnancy sexually transmitted infectionscan be passed from a woman to her baby. Ways STIs can harm the baby include: low birth weight, dangerous infections, brain damage, blindness, deafness, liver problems, or stillbirth.

Thyroid disease: Unrestrained hyperthyroidism (overactive thyroid)is a health problemthat can cause heart failure and poor weight gain in the fetus. Itcan be dangerous to the mother. Birth defects can be caused byunrestrained hypothyroidism (underactive thyroid)which also threatens the mother's health(women's health, 2017).

Uterine fibroids: These are not uncommomand can cause symptoms that require treatment. Miscarriagesare rarely caused byuterine fibroids,but preterm or breech birthare sometimes caused by fibroids. If a fibroid blocks the birth canal,cesarean delivery may be needed.

2.5 Diagnosis of pregnancy

Three (3) main diagnostic tools,multifaceted tools are (diagnostic tools or approaches)used forthe diagnosis of pregnancy: history and physical examination, laboratory test, and ultrasonography. These tools are currently used by, physicians to diagnose pregnancy at early gestation and to help rule out other pathologies(Andrea, Shields and FACOG, 2017).

Diagnoses of Pregnancy Human chorionic gonadotrophin (hCG) presence in the mother's serum and urineis used to diagnose pregnancy.

- Urine testsin pregnancy.
- Agglutination Test in pregnancy: Coatinglatex particles, or sheep erythrocyte (tube) with anti-hCG.
- Agglutination Inhibition Tests
- Dip stick
- Quick and simple tests based on enzyme-labelled monoclonal antibodies assay can detect low level of hCG in urine during pregnancy **(**Diaa and EI-Mowafi, 2017).

2.6 PregnancyStages

Symptoms during the First Trimester (0-12 Weeks)

Amenorrhoea: The most common symptom denoting pregnancyis the sudden cessation of a previously regular menstruation. Also, pregnancy may occur during lactational amenorrhoea. During pregnancybleeding may occur earlyincases of threatened abortion.Slight bleeding may occur at the expected time of menstruation in the first trimester,but not afterwards because of separation of parts of the decidua vera **(**Diaa and EI-Mowafi, 2017).

Early Morning Sickness: The woman may experience nausea which is followed by vomiting in the morning. It appears 6 weeks after onset of the last menstrual period and usually disappears 6 to 12 weeks later.Morning sickness can happen anytime, not just in the morningit is as a result of pregnancy hormones. Some pregnant women sometimes vomit or feel sickbecause of certain foods or its smell. Empty stomachs makes some women to feel sick (familydorctor.org, 2015).

MicturitionFrequency: This is because of congestion and pressure on the bladder, during the first trimester, which will come up again at the third trimester of pregnancy, when the foetal head descends into the maternal pelvis **(**Diaa and EI-Mowafi, 2017).Little urine may occur when coughing or sneezeingdue to extra pressure on the bladder.

Breast Symptoms: Early in pregnancyin preparation for breastfeeding the hormones in the body are changing. Enlargement, feeling of fullness, tingling and tendernessof the breast occur.

Signsnoticed in the Breast:

- Growth in size and vacularization.
- Pigmentationof the primary areolaand increased nipple.
- Presence of the secondary areola.
- Montgomery's follicles.
- Colostrumappearances.

These are seen only in the breast of a women with the first pregnancy. In women who are pregnant for the second time or more, it may be due to the previous pregnancies. **(**Diaa and EI-Mowafi, 2017).

Signsnoticed in the uterus:

- Enlargement, globular and softness of the uterus,
- Bimanual examination,will reveal contractions of the uterus (Palmer's sign).
- The two fingers in the anterior fornix during bimanual examinationcan be approximated to fingers of the abdominal hand behind the uterus because of the softening at the lower part of the uterus and its emptiness. This is verified within 6-10weeks but not after because the growing fetus will fill the whole uterine cavity(Hegar's sign).
- The cervix will be violet, hypertrophied and soft.
- The Vagina will be violet, moist, and warm with increased acidity **(**Diaa and EI-Mowafi, 2017).

Pelvic Changes: Goodell's Sign, and Osiander's Sign – Jacquemier's Or Chadwick's Sign.

Goodell's Sign: As early as the 6th week,the pregnant cervix becomes soft and feels like the lips of the mouth. Due to the increased vascularity,on speculum examination the bluish discolouration of the cervix is visible.

Osiander's Sign: At 8th week there will be increased pulsation,felt through the lateral fornices.

Jacquemier's orChadwick's sign. This is due to local vascular congestion. At 8th weekdusky hue of the vestibule and anterior vaginal wall will be visible. It is more pronounced as pregnancy

advances and is more definitely present in multiparae.

Emotional symptoms: Forgetfulness, ordifficultyto concentrate, tiredness andmoodyfeeling, are all caused by pregnancy hormones.

Lightheadedness: It can be caused by hunger, weakness, or stress.Dizziness or lightheadedness can occur as the body makes extra blood to support the growing baby(familydorctor.org, 2015)

Heartburn: The process of breaking down food is given more timeto enable the body absorb nutrients. However, heartburn may occur because of relaxation of the muscles in the body that break down food during pregnancy and therefore making food stay in the stomach longer.

Constipation: Due to slow process of breaking down food there is gas, constipation, and bloating. Constipation can occur during pregnancy as a result of intake of vitamins that contain iron. To help with constipation, stool softener or fiber supplements should be taken. To prevent constipation, intake of a lot of water (about eight glasses per day) will help.

Noticeable veins: This is knowm as veracious veins. They are blue veins on the abdomen, breasts, and legs. The veins can become more noticeableas the body makes extra blood and the heart pumps faster in pregnancy. From a central areaminute blood vessels radiating out like the legs of a spider,on the face, neck or arms may develop (familydorctor.org, 2015).

Changeson the Skin: Due to increased blood circulation,the skin will look rosy and shining during pregnancy. Extra oil will be on the skinbecause of pregnancy hormones, which flare-uptemporary acne(familydorctor.org, 2015).

Vaginal changes: The vaginalining will become thicker and less sensitive. In pregnancy, thin whitish discharge, which is normal during pregnancymay be noticed. However, if any vaginal hemorrhage is severe or painful, the health professional should be consulted(familydorctor.org 2015).

PregnancyInvestigations

When the women's serum and urinecontain human chorionic gonadotrophin (hCG) in.

- Urine testsfor pregnancy:
- Agglutination Test:coating latex particles, or sheep erythrocyte (tube) with anti-hCG.
- Agglutination Inhibition Tests
- Dip stick test
- Rapid and simple tests based on enzyme-labelled monoclonal antibodies assay can detect low level of hCG in urine **(**Diaa and EI-Mowafi, 2017).

False positive results causes:

- Proteinuria.
- Haematuria.
- At ovulation time (cross reaction with LH).
- HCG injection for infertility treatment,within the previous 30 days.
- Thyrotoxicosis (high TSH).
- Premature menopause (high LH & FSH).
- Early days after delivery or abortion.
- Trophoblastic diseases.
- hCG secreting tumours **(**Diaa and EI-Mowafi, 2017).

False negative resultcauses:

- Missed abortion.
- Ectopic pregnancy.
- Early pregnancy.
- Urine stored too long in room temperature.
- Medicationsinterfering.
- Serum pregnancy tests:
- Radioimmunoassay of b -subunit of hCG.
- Radio receptor assay.

- Enzyme- linked immunosorbent assay (ELISA), can be used for urine and serum **(**Diaa and EI-Mowafi, 2017).

N**egative pregnancy test will be about:**

- After labour,(one week)
- after abortion, (2 weeks)
- After evacuation of vesicular mole (4 weeks).

Pregnancy test:

- PregnancyDiagnosis.
- Foetal deathDiagnosis.
- Ectopic pregnancyDiagnosis.
- Follow up of gestational trophoblastic diseases and diagnosis.

Ultrasonography: Gestational sac can be detectedafter 4-5 weeks of amenorrhoea. As early as 7 weeksfoetal heart pulsation can be detected(Diaa and EI-Mowafi, 2017).

Symptoms during second trimester (13-28 Weeks)

- Amenorrhoea.
- Decrease in urinary and early morning sickness symptoms.
- Foetal movement felt by the motherfor the first time is known as Quickening, and it occurs at 18-20 weeks in primigravida and at 16-18 weeks in multiparas.

Signs

- More manifestation of the breast.
- On the skin as cloasma, linea nigra and striae gravidarum.

Uterine signs:

- Abdominally uterine signs are felt.
- On abdominal examination,intermittent painless contractions can be felt(Braxton Hick's contractions).

Foetal signs:

- At 16 weeks, the anterior fornixinner ballottement can be causedby a push to the foetal parts with the two fingers.
- At 20 weeks,outside ballottement can be elicited by a push to the foetal parts with one hand abdominally and the other hand getting the impulse.
- At 20 weeks,palpation of foetal parts and movement by the obstetrician.
- At 20-24 weeks, utilizingPinard's stethoscopefoetal heart sound can be auscultated.
- Murmur with the same rate of FHS due to rush of blood in the umbilical arteries is also known as umbilical (funic) souffle. It can be identified when a loop of the cord lies below the stethoscope **(**Diaa and EI-Mowafi, 2017).

Doubtful cases test

- Pregnancy tests.
- Ultrasonography.
- X-ray: It shows the foetal skeleton starting from the 16th week of pregnancy. It has been replaced by ultrasonography due to the following hazards:

-Teratogenic effects particularly before 10 weeks.

-Chromosomal changes in the foetal gonads leading to genetic disorders in the following generations.

-Subsequent leukaemia in childhood (Diaa and EI-Mowafi, 2017).

Growth of the babyduring 2ndtrimester

A chicken breast will be the weight of the baby by the 18th week of pregnancy,now thebaby can yawn and hiccup, and the baby's fingerprints can be felt on the tiny digits. By week 21the newly formed arms and legsof the baby can give little jabs and kicks. The baby'sweight will doublebyweek 23. The baby will weigh 2-poundby the end of the second trimester(Cuiyan Liu and Stocksy, 2017).

The baby's first tiny hairs are starting to sproutbyweek15, and by week 22, there will be eyelashes and eyebrows. Baby's skin is now covered in lanugo (a downy "fur coat" that builds

up more fat in the third trimester) and byweek 19, vernix caseosa (a greasy layer of oil and dead skin cells that shield the skin from acidic amniotic fluid) both of which will shed before birth.

Digestive system: The baby's digestive system is fully formedby the end of week 12 and the baby is starting to suck and swallowin preparation for extrauterine life. Through the amniotic fluid thebaby can tastethe foods, (that is why it is important to chow well before swallowinga healthy pregnancy diet filled with a variety of fresh fruits and vegetables). Baby's elimination systems are working although the baby still gets nutrition through the placenta, by swallowing and also urinating every 40 minutes (Cuiyan Liu and Stocksy, 2017).

The baby senses: Before week 22 of pregnancythe ears and eyes will be in their correct positions. The baby will start to smell, see and hear, and the little eyes are beginning to openatweek 22.

Heart: By week 17, baby's heart is no longer beating spontaneously.The brain is regulating the heartbeat and it can be heard with a stethoscope by week 20. At week 25, capillaries begin forming to carry oxygenated blood through the body.

Brain: Thebrain of the baby will start controlling the blinkingof the little eyelids,inaddition to controlling the baby's heartbeat and inducing kicksby the week24.

2.7 Other Changes Noticed During Pregnancy

The body changes

During this trimester, symptoms will continue(like heartburn and constipation).Others changes may come up for the first timeas levels of hormones riseand the baby keep growing.These mayincluds:

- Snoring for the first time which could be caused by increased flowof blood to the body's mucous membranes(including the nose), some OTC medications are safe to use during pregnancy (Cuiyan Liu and Stocksy, 2017).
- Minor swelling of the ankles and feet, which may last until delivery in three or four pregnant women around week 22. These wome have to elevate feet, keep active,to reduce puffiness, avoid standing or sitting for long and sleep on the side.

- These women have to visit the dentist if there are signs of gingivitis,(gums are bright red and bleed easily),(which is harmless but can develop into a bigger problem if not treated).These can be normal sometimes.
- These women have to eat adequate diet during pregnancy. This will decrease the second trimester leg cramps, which might continue till the end of pregnancy. It could also be as a result of shortage of calcium or magnesium (Cuiyan Liu and Stocksy, 2017).
- Lower blood pressure which causes dizziness, to reduce symptoms feed frequately but on small meals.
- Round ligament pain, which occur at the lower abdomen,this increases due to stretching of ligaments that support the abdomen as the baby increase in size.
- After pregnancy varicose veins and/or hemorrhoidswill disappear if it is related.

Changes should be made in the bedroom at the second trimester. The changing body size and symptoms also effect the couple's sex life. At this period, many women are very active than before.During the dry spells, effective communication is important. It was observed that sex have no emotional effect on the fetus(Cuiyan Liu and Stocksy, 2017).

Heartburn: The growing uteruspressed, on the stomach and forces food and acid up into the esophagus. This causes a burning feeling in the esophagus, and it will get worseduring the second trimester.

Infectionsof the urinary tract: Effect of the growing uterus and hormonal changes will not allow the bladder to empty completely, soinfections of the urinary tract may develop. This can lead to preterm labour, report to the health care provider if there is a feeling of burning sensation when urinating, frequency of urine, blood in urine or a strong odor while urinating (familydoctor.org, 2015).

Symptoms in the third trimester (29-40 Weeks)(All test positive)

Sure Signs of Pregnancy

- Palpation of foetal parts.

- Palpation offoetal movements.
- Auscultation of foetal heart sounds.
- Umbilical (funic) souffleauscultation.
- Detection foetal skeletonby X-ray.
- Ultrasonographic detection of foetal parts, movements and /or heart movements.

Differential diagnosisin pregnancy

- Causes of amenorrhoeain early pregnancy.
- Myoma, Adenomyosis, Pyometra, Haematometra, and Metropathia haemorrhagicacauses of symmetrically enlarged uterus.
- Swellingsof the Ovaries, Tubal swellings, Pelvic haematocele, Full bladderPelvi-abdominal swellings.
- Late pregnancy: Myomas, Ovarian neoplasm, Ascitis, Pseudocyesis (Diaa and EI-Mowafi, 2017).

28thWeek: False labor(Braxton Hicks contractions) contraction of the uterine muscles in preparation for labor and delivery. There may or may not be pain in false labour but the abdomen will feel thight and contractions are not regular (familydoctor.org2015).

29thWeek: The baby makes the following movements: kicking, stretching and grasping

30thWeek: Thehead will have hair, and the eyes will open. Red blood cells are formed in the bone marrow.The baby will be 10 1/2 inches (270 millimeters) long and weigh 3 pounds (1,300 grams)(Moore et al, 2016).

31stWeek: Major developmentwith rapid weight gain are made(American College of Obstetricians and Gynecologists, 2015).

32ndWeek: Baby's toenails are visibleand breathing is with problem.Lanugo starts to disappear.The baby should be 11 inches (280 millimeters) long and weigh 3 3/4 pounds (1,700 grams).

33rdWeek: The pupils can change size in response to light. Theskull remains soft and flexible whilebones are hardening(American College of Obstetricians and Gynecologists, 2015).

34thto 37thWeek: In preparation for delivery, lightening will take place. The breasts may bring colostrum.

38thWeek: The pregnancy is full-term, and lanugo starts to disappear.

39thto 40thWeek: Preparation for delivery, the baby can be delivered 2 weeks before or after 40 weeks.

2.8Care and activities during antenatal care

The services given at ANCincludes weighing the women and checking their height, BP, pulse, respiration, measurement from thesymphysis to the fundus, abdominal circumference, fetal heart rate. Also,other assessments include examinationof the vagina; urine protein test, anemia and HIVtests, tetanustoxoid vaccination, folate and iron supplement, intermittent preventive treatment for malaria and prenatal medical consultation (Tran, Gottvall, Nguyen,Ascher andPetzold, 2012).

Table 2.1: World Health Organization (2016) Model of Antenatal Care

1st trimester
First visit: 0 to 12 weeks
2nd trimester
Second visit: 13 to 20 weeks Third visit: 21 to 26 weeks
3rd trimester
Forth visit : 27 to 30 weeks Fifth visit: 31 to 34 weeks Sixth visit: 35 to 36 weeks Seveth visit: 37 to 38 weeks Eight visit: 39 to 40th weeks Coming back for delivery at 41 weeks if not given birth

Table 2.2:The ANCeightvist model outlined adopted from WHO clinical guidelinesGoals

Activities	First trimester	Second trimester	Third trimester	Third trimester
	Visit 1; 8 to 12thweek	Visit 2; week 20 Visit 3; week 26	Visit 4; week 30, Visit 5; week 34, Visit 6; weeks 36, Visit 7; weeks 38,	Visit 8; week 40. Coming back for delivery at week 41 if not given birth
	Confirm pregnancyand EDD, classification of women for basic ANC (8visits) or more. Preventive measuresafter screening / treatment. Cultivate a delivery and emergency plan. Advise and counsel	Maternal andfetalcheck. Rule out PIH and anaemia. Give preventivemeasures. Modify birth and emergency plan. Advise and counsel	Maternal and fetal well-being check. Exclude PIH, anaemia, multiple pregnancies. Give preventive measures. Modify birth and emergency plan. Advise and counsel	Maternal andfetal well-being check. Exclude PIH, anaemia, multiple pregnancy, malpresentation. Give preventive measures. Modify birth and emergency plan. Advise and counsel

Activities: assess emergency signs, give adequate treatment, and refer to hospital if needed

Collect data (observe and recordshistory)	Examine importantsymptoms. Psychosocial, medicaland obstetric history taken. Confirm pregnancy and calculate EDD. Categorise all women (after test results)	Examine importantsymptoms. Note pastcomplications and management during pregnancy. Re- Categoriseif needed	Examine importantsymptoms. Note past complications and management during pregnancy. Re- Categoriseif needed	Examine important symptoms. Notepast complications and management during pregnancy. Re- Categoriseif needed
Investigation (look, listen, feel)	Complete investigations general, and obstetrical, BP	Anaemia, BP, fetal growth, and movements	Anaemia, BP, fetal growth, multiple pregnancy	Anaemia, BP,fetal growth and movements, multiple pregnancy, malpresentation
Screening and Tests	Haemoglobin Syphilis, HIV Proteinuria Blood/Rh group* Bacteriuria*	Bacteriuria*	Bacteriuria*	Bacteriuria*

Treatments	Syphilis,ARV if eligible Manage urinary microganism if recommened*	Antihelminthic**,ARV if eligible Manage urinary microganism if recommened* Prophylaxis for malaria Manage intestinal parasite	ARV if eligible Manage urinary microganism if recommened*	ARV if eligible If breech, ECV or referral for ECV Manage urinary microganism if recommened*
Protective Measures	Tetanus toxoid Iron and folate+	Tetanus toxoid, Iron and folateIPTpARV	Iron and folateIPTp ARV	Iron and folate ARV
Health education, and counseling	Use of alcohol and tobacco, nutrition, safe sex, rest, sleeping under ITN, birth and emergency plan	Birth and emergency plan, reinforcement of previous advice	Birth and emergency plan, infant feeding, postpartum/postnatal care, pregnancy spacing,reinforcement of previous advice	Birth and emergency plan, infant,feeding, postpartum/postnatal care, pregnancy spacing, reinforcement of previous advice.

2.9Complications in pregnancy

Problems arising from pregnancy and child birthcan lead to the death of women. Preventable or treatable complications can develop and some of them candegenerate in pregnancy, particularly when they are not managed as part of the woman's care. Seventy five percent of all maternal deaths can be caused by problems. Such problems include;

- Severe heamorrage postpartum
- Postpatrum infection
- Pregnancy induced hypertension and eclampsia
- Complications from delivery
- Insecure abortion(Say, Chou, Gemmill, Tunçalp, Moller, and Daiels, et al, 2014).

All are pregnancy related problems. Complications,symptoms and discomforts of pregnancy can not be differentiated. In some cases,the health of the mother or babyis not seriously effected by these problems.Pregnancy complicationsif untreated, may cause both maternal and fetal death.That is why all women need access to health professionalsduring ANC, childbirth, and postpartum (UNICEF, 2015).

Complications that occur in pregnancy which are not identified early and even when identified are not effectively managed cause high MMR. Most of them include: hemorrhage, infection, hypertensive disorder of pregnancy, obstructed labour and anaemia. Ifcare is not given,a healthy woman will die within hours due to severe bleeding after birth. Administering oxytocin immediately after childbirth successfullydecreases the risk of heamorrage.Recognising and treating early signs of infections after childbirth is a timely mannerof eliminating any complication the infection will cause to the woman.

Before convulsion starts, pregnancy induced hypertension and eclampsia should be detected and managed, likewise other life-threatening complications. Awoman's risk of developing eclampsiacan lower by drugs like magnesium sulfate for pre-eclampsia.To reduce maternal death, unwanted and too-early pregnancies should be prevented. Access to contraception, safe abortion services to the full extent of the law, and quality post-abortion careshould be available to all women, including adolescents (UNICEF, 2015).

A condition known as hypertension or high blood pressure**,** arisewhen arteries carrying blood from the heart to the body organs are constricted. This increases arteries pressure, and makes it difficult for blood to reach the placenta, which provides nutrients and oxygen to the fetusin pregnancy. The growth of the fetus can be slow because of decreased blood flow which can place the mother at greater risk of preterm labor and preeclampsia. Women living with high blood pressure before they get pregnant will continue to have to monitor and control it, with medications. HighBP that comes up in pregnancyis known as gestational hypertension, also it occurs during the second half of pregnancy and goes away after delivery (American College of Obstetricians and Gynecologists, 2014).

Risk factorsthat are General: The pregnant woman's medical history may show risk factors that can effect the mother, fetus or both. These factors may be physical, mental, social or a combination of factors(Kourtis, Read, and Jamieson, 2014).

Other risk factors that are common include:

- The couple's age
- Teenage parents
- Elderly parents
- Environmental toxinsexposure in pregnancy
- Ethanolconsumption during pregnancy.
- Tobacco smoking in pregnancy will lead to premature rupture of membranes, placenta previa and placenta abruption(Kourtis, Read and Jamieson,2014).

In 2015, about 40% of pregnant women from developing conutries attended four visit ANC.It is a fact that women are beingprevented from receiving or seeking care during pregnancy and childbirth, byfactors like:

- lack of finance
- location of ANC
- Ignorance
- Insufficient services
- Cultural practices.

Hinderances to quality maternal health services must be examined and taken care of at all levels of the health systemto improve maternal health (WHO, 2016).

Maternal problems

Hyperemesis gravidarum (HG): It makes the mother to lose weight and it causesvomiting which is severeand leads to dehydration. It is different from the morning sickness and has deadly complications.

Signs and symptoms: Daily vomiting that is frequent with nausea, loss of appetite, weakness, dehydration and fainting.

Treatment: Intake of dry, bland foods and fluids is important. Administer drugs as prescribed to assist the woman with nausea. Some women on adminission are placed on intravenous fluids especially when it is confirmed they have HG. The discomfort will stop by the 20^{th} week of gestation but in some women it will persistthroughout pregnancy(Kourtis, Read and Jamieson, 2014).

Pelvic girdle pain (PGP): It is multiple pain and is caused by a lot of factors from the peripheral and central nervous system. It causes stiffiness of the muscles and affects gait and weight bearing. These signs can occur before or after gestation. Weeks after delivery, the PGP will resolve in some women and in others, it can last for years resulting in reduced tolerance for weight bearing activities(Kourtis, Read and Jamieson,2014).

Treatment: The severitydetermines, the degree of treatment. Pain is usually manageable.In a mild case, rest and rehabilitation therapy are required. Mobility aids, strong analgesics and sometimes surgeryare required in more severe cases. Education, information and supportare the main factors in helping women cope. Many treatment options are available(Kourtis, Read and Jamieson, 2014).

Hypertensive states(severe): Pregnancy induced hypertension also called preeclampsiais caused by gestational hypertension, proteinuria and edema.

Severe preeclampsia has the following features, BP of 160/110mmHg and other signs

Eclampsia causes fits in a preeclamptic patient

HELLP syndrome has the following features haemolytic anemia, elevated liver enzymes and low platlet count, in some cases acute fatty liver.

Signs and symptoms: Hypertension, oedema of the hands and face, proteinuria, stomach pain, blurred vision, dizziness and headaches

Treatment: Delivery is the only solutionfor the baby to survive. If the woman is about 37 to 49 weeks of gestation with mild symptoms, induction of labour will be recommended. The woman and the baby will be under the health care giver's close observation. Rest and administration of prescribed drugs at home or in the hospital is necessary to reduce the blood pressure and fits(Kourtis, Read and Jamieson, 2014).

Deep vein thrombosis (DVT): After heamorrage, DVT is the second most common cause of maternal death in developing countries. The incidence is 0.5 to 7 per 1,000 pregnancies

Causes: Pregnancy-induced hypercoagulability as a physiological response to potential massive bleeding at childbirth.

Treatment: Heparin withlow molecular weight is used as Prophylactic treatment. Other risk factors of DVT are identified and treated also.

Anaemia: Healthy red blood cellslower than normal number. Be reminded that in the third trimesters,levels of haemoglobin are lower. Foods containing iron and tablets are increased because of the effect of anaemia in pregnancy. Other treatment methods can be used (oral tablets, parental iron).

Signs and symptoms: Weakness, looking pale, fainting and shortness of breath.

Treatment: Managing the underlining cause of the anaemia is important to help restore the healthy red blood cells. Iron and folic acid supplements are used by women with pregnancy related anaemia (Kourtis, Read and Jamieson, 2014). To be sure anaemia does not happen againthroughout pregnancy,iron level is checkedduring ANC.

Infection: Susceptiblity to certain infectionsoccur more in pregnant women. Increased immune tolerance in pregnancyis the cause ofthis increased risk.The fetus is protected from immune reaction, it also prevents physiological changes in the mother, both reduced respiratory volumes and urinary stasisbecause of the enlarging uterus (Kourtis, Read and Jamieson,2014). Pregnant

women are severely affected by influenza, hepatitis E, herpes simplex and malaria. Coccidioidomycosis, measles, smallpox, and varicellahave more limited evidence(Kourtis, Read and Jamieson, 2014).Most infections are vertically transmissible, from the mother to the unborn child inutero or during birth.

Fetal problems: Theseusually occur in the placenta or in the fetus and have effect on the woman.

Ectopic pregnancy: The fertilized egg implant in the fallopian tubes not the uterus.

Causes: It is not known, but smoking, advanced maternal age and prior damage to the fallopian tubes are some of the risk factors (Kourtis, Read and Jamieson,2014).

Signs and symptoms: Severe pain in the lower abdominal region,which radiates to the shoulder, bleeding per vagina, dizziness or fainting.

Treatment: In this case,spontaneous resolution is the best management since the egg cannot develop. Durgs or surgery is used to effectively prevent damage of the organs or death to the mother.Drugs or surgery is used to remove the ectopic product.

Abruptio placenta: It is theseparation of the placenta from the uterus during gestation. **Causes**: There are risk factors like maternal high blood pressur, trauma and use of drugs.

Signs and symptoms: Bleeding via the vagina, cramping, pain in the abdomen and tenderness.

Treatment: At 36 weeks and above, the fetus should be delivered at once if there is maternal and fetal distress. If the fetus is not matured and the woman is in a dangerous condition the woman should be admitted into the hospital. The woman should be confined in bed until the bleeding stops in cases of minor separations. In cases of moderate separations, bed rest should be complete. In severe cases, when half of the placenta is separated, the baby should be delivered immediately under adequate medical attention(Kourtis, Read and Jamieson, 2014).

Placenta previa: It occurs whenall the cervical opening inside the uterus is covered by the placenta.

Signs and symptoms: Many pregnant women do not have symptoms while some have painless bleeding via the vagina in the second and third trimesters.

Treatment: The diagnosis of placenta previa at the 20th week of pregnancy without bleeding should be followed by reduction in activities and complete bed rest. If bleeding is heavy admission will be necessary to mornitor and ensure stability of the fetus and mother. The woman should be confined in bed until the baby is termed even when the bleeding stops or is light. In most cases, the delivery will be by cesarean section if bleeding doesn't stop or if there is preterm labour(Kourtis, Read and Jamieson, 2014).

Multiple pregnancies: It can be as a result of one chorion and it is known as monochorionic.If it is shared, can lead to twin-to-twin transfusion syndrome. It may be sharing the same amniotic sac leading to monoamniotic which may result to risk of umblical cord compression and entanglement.The functions of the internal oragan may be impaired in conjoined twins which may result in very rear cases (Kourtis, Read and Jamieson,2014).

Vertically transmitted infection: The immune function of the embryo and fetus is impaired inutero. The immune function of the mother protects the embryo and fetus throughout pregnancy. Perinatal infection are mainly caused by pathogens that can cross the placenta. The developing embryo or fetus can be in a dangerous condition due to minor illnesses caused by microorganisms in the mother. Spontaneous abortion or major developmental disorders may result from these conditions. At particular stages in pregnanacy, the fetus may be at risk of many infections. However in perinatal infection the problems are not always directly noticeable. Other transplacental infections include TORCH complex(Kourtis, Read and Jamieson,2014).

Mothers can also infect their babies via the birth canal during delivery. The babies are exposed to maternal blood and body fluids without the placental barrier intervening, and through the maternal genital tract during birth. Hepatitis B, and HIV which are blood-borne microorganisms,gonorrhoea and chlamydia which are organisms associated with sexually transmitted diseases, and candida which is normal fauna of the genito-urinary tract are among those commonly seen in infection of newborns (Kourtis, Read and Jamieson,2014).

Miscarriage: This occurs before the first20 weeksofgestation. For known pregnancies, 10 to 20 percent end in miscsrriage. Before the 12th week of pregnancy, 80 percent of miscarriages happens. Majority of fisrt trimester miscarriages are caused by chromosomal abnormalities in the

fertilized egg which prevent the embryo from developing.The healthcare practitioner should be called right away if there is spotting or bleeding via the vagina which is usually the first sign seen, (in some cases, it is normal in early pregnancy even when miscarriage is not taking place). Verification of the condition of the fetus can be done using an ultrasound and possibly do a blood test, if the practitioner suspects a miscarriage(BabyCenter, 2017).

Factors of Reproduction: The hazard of a woman dying during pregnancy and childbirth depends on the number of pregnancies she has had in her life time. Pregnancy related death increases with increased number of pregnancy. There is higher maternal mortality in women 35 years and above and women with four and five children (WHO, 2014).

Factors relating to health services: To prevent maternal mortality the pregnant woman should attend healthcare services, where she will receive quick recognition and management of related problems. The major problems in developing countries are lack of trained staff, equipments, supplies and facilities. In places where health care sevices exist it might be expensive for the pregnant women to use it (WHO, 2014).

Factors relating to culture and socio-economy: Pregnantwomen do not have power to make decision over their fertility, health and health care services, which have affected maternal mortality. In areas where women have low status in the society, their health needs are neglected and they cannot access the health facilities. Delay in seeking care by women is caused by ignorance, illiteracy and understanding of health related issues, this may also lead to delays in seeking care and management of pregnancy complications (WHO, 2014).

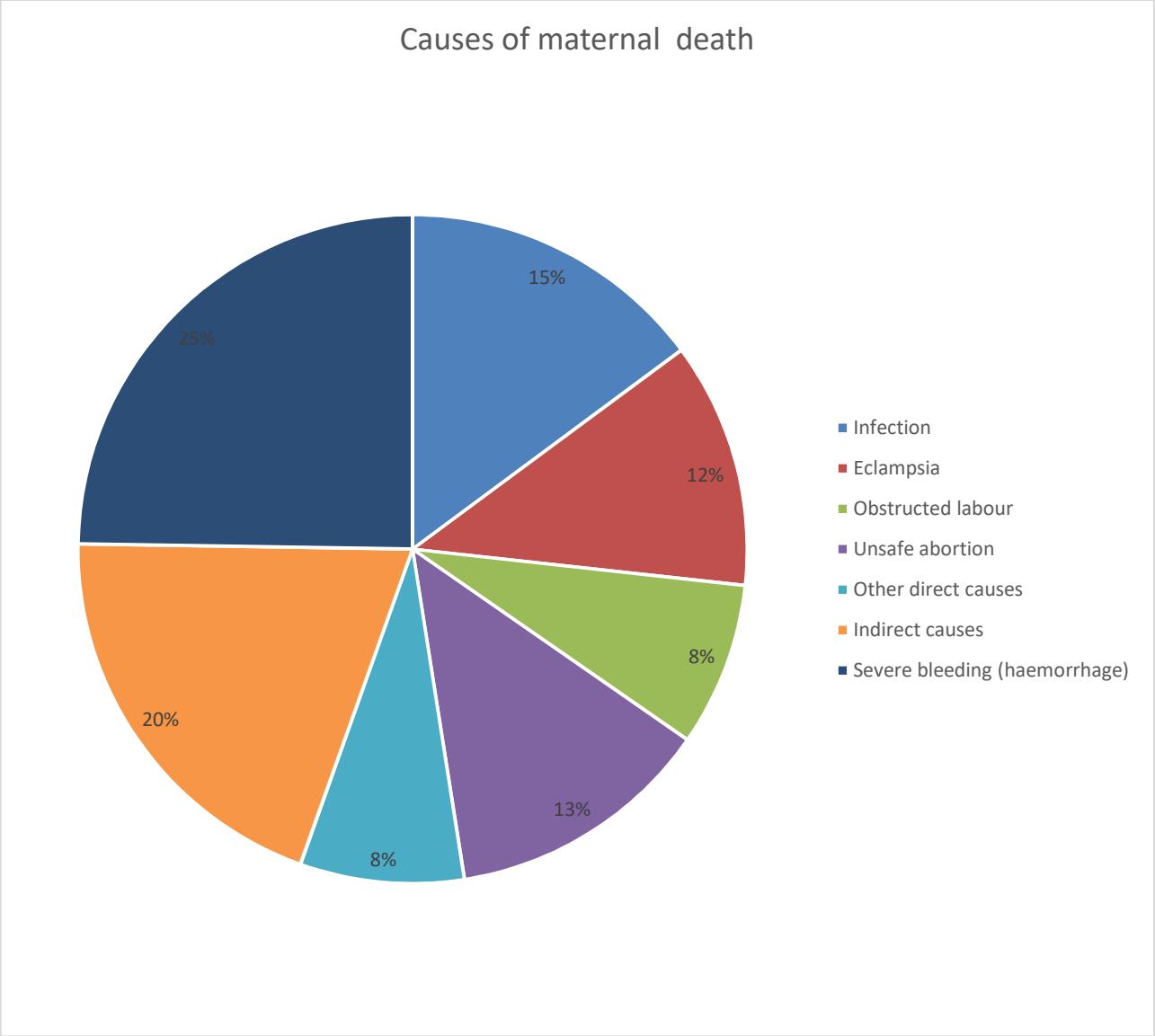

FIG 2. 1: Source: The World Health Report 2005. Make every mother and child count

Genva: World Health Organization 2005

2.10Knowledge of ANC

In the area of maternal and child health (MCH), the need for understanding the status of knowledge of both the service providers and targeted service users, their perceptions of the service/intervention being promoted, as well as general populations or specific group's health seeking behavior remain urgent. This would help the authorities concerned to identify the determinants of health seeking behavior in relation to particular health services/interventions and design mechanisms that would promote the provision and coverage of specific services/ interventions towards attainment of the predetermined goal (Maputle et al., 2013cited in Mubyazi,2015).

In the area of antenatal care (ANC) services, medical and nursing experts suggest the need for pregnant women to seek the care needed where they are properly informed so that they can take appropriate actions in relation to thecare needed. It is recommended that the health service client needs to have understood both the information provided and the full implications of all the alternative courses of action available. For this reason, health service clients, for example, pregnant women in this case cannot make right ANC seeking and service use decisions if they lack the right information at the right time and in a comprehensible way(Mubyazi,2015).

2.11Adherence to ANC

Nigeria is one of the countries with lower ANC services adherence in African. According to many authors, low adherence to antenatal care is the major cause of high MMR in Nigeria. Only 57% ofNigeria pregnant women made the WHO recommended 4 visitswhile 61% made one visit to skilled ANC provider(WHO, 2014). Pregnant women in rural areas do not adhere to antenatalservices even those with its basic knowledge because of problem with accessibility to maternal and child health facilities(Ojong, Uga and Chiotu, 2015).According toMersal, Esmatand and Khalil (2013),their study group had better compliance than the control group with $p < 0.001$. The control grouphad low birth babies,32.6% compared to the study group 9.3% with $p = 0.008$. On occurance of complications during labour, there is a statistical significant difference between the study and control groups with $p = 0.003$.Among Women who were members of a vulnerable population,the study revealed that prenatal health education is an important and successful strategy for reducing health disparities among them(Mersal, Esmat andKhalil,2013).

In Nigeria, the most common problems facing adherence of ANC are availability, affordability, and accessibility of ANCby poor rural women with little or no education. Aatenatal care services should be made attractive and accessible to pregnant women and nursing mothers in Nigeria by a joint effort. The focus of the efforts should include financial and cultural barriers to ANC use, quality improvement to increase adherence toANC services and satisfaction, and maximal contacts among the woman, the service providers and the health services.

2.12 The **stages of labour**

According to Babycenter (2014), labour and birth are divided into three stages;

First stage: Commenceswith regular contractions that cause progressive changes and opening of the cervix until it is fully dilated. It is divided into two stages;

- **Early labour:**There is a gradual effacement (thining out) and dilation (opening) of the cervix.
- **Active labour:**There is a rapid dilation, longer, stronger and closer contractions. Thisis called**transition**.

Thesecond stage: Starts when the cervix is completely dilated and ends with the birth of the baby. It is known as the pushing stage.

Thethird stage: Commence immediately the baby is born and ends with the birth of the placenta. The length and wide variation of labour differ in every pregnancy. Labour takes about 10 to 20 hours in primip gravidas. In some women, it can be longer, while in others it can be shorter. For multi gravidas, labour progresses more quickly, especially for those who have had vaginal delivery before.

2.13Maternal Mortality: Preventable causes related to pregnancy and childbirth have been the cause of about 830 women's deathevery day(WHO, UNICEF, UNFPA, World Bank Group, and the United Nations Population Division, 2015). Among women living in rural and poorer communities,it was discovered that maternal mortality is highest(WHO, 2016). Also, among the young adolescents, there ishigher risk of complications and death from pregnancy. Before, during and after childbirth health care services from a professional can save the lives of women

and their babies. There was a drop of about 44% in maternal mortality between 1990 and 2015. The target of Sustainable Development Goals3 is to decrease the global maternal mortality ratio to less than 70 per 100 000 live births between 2016 and 2030with no country having a maternal mortality rate of more than twice the global average. The decline in global maternal mortality ratio was 2.3% per year between 1990 and 2015, while from the year 2000 and above there was an increased decline. Between 2000 to 2010, the annual decline was 5.5% in some countries (Alkema, Chou, Hogan, Zhang, Moller, Gemmill,Lancet et al, 2016).

It was reported that12%of all maternal deaths in Nigeriais caused by puerperal sepsis. The hospital factors predisposing pregnant women to puerperal sepsis which leads to mortality is unknown, (Antor, 2014).The choice to deliver at home, in a church or in a traditional birth centre after attending antenatal clinics in a health facility, according to some scholars were the individual factors that causehigh maternal mortality, among others. Some unbooked women also go into the hospitals as emergency cases, with complications on the day of their delivery(Antor, 2014).According to Ezugwu, Agu, Nwoke and Ezugwu (2014), in a study at Enugu State University Teaching Hospital (ESUTH),eclampsia and obstetric bleeding, (especially post-partum bleeding)are the two most common causes of maternal death.They also reported a high MMR of 840/100 000 which to them is unacceptably high.

2.14Utilisation of delivery services: According to World Health Organisation, utilisation of skilled health ANC in developed countries is 99.5%. In 2010, the deliveries taken by health professionals in developing countries increased from 55% in 1990 to 65% in 2010. Sub-Saharan Africa with 45% was with the lowest proportion of birth taken by health professionals, followed by Southern Asia (49%), which also had the highest number of maternal death. In every region, women living in the villages have lower skilled birth attendants than those in the urban (Fekadu and Regassa, 2014). A large number of births, still takes place outside the health facilities because of one reason or the other. High quality maternal health care in Nigeria is affected by the economic situation, culture and the large land mass. However, culture is the main factor that influence the women's ability to make decisions about their health care. From the onset of pregnancy to past partum, women should be encouraged to obtain consent or permission globally, from their partner or family to seek professional care. One out of the three primary

barriers to skilled attendance during delivery might be allivated by this (Respectful Maternity Care, 2015).

During delivery, the risk of complications and infections that could cause death and serious illness among women and infants could be reduced with good medical attention and hygienic conditions. Skilled health providers in Nigeria a decade age conducted 35% of deliveries while 33% deliveries were at health facilities. Skilled health attendants in Nigeria conducted 38% of deliveries and about 36% of deliveries took place in health facilities indicating an improvement.

Less educated women living in the rural areas are not likely to receive attention from health professional nor even deliver in the health facilities. The ANC and type of delivery care a mother receive, depend on the mother's background characteristic. Rural women are less likely 23% than the urban women 67% to have assistance from a health professional during delivery (NPC and ICF, 2014). The mother's educational level has the probability to increase her chances of receiving assistance from a health professional, from 12 percent among births in mothers with no education to 93 percent among births in mothers with more than secondary education (NPC and ICF, 2014).

Another studycarried out in Ethiopia showed that 54% of women received ANC for their recent births while only 4.1% gave birth at a health facility. The women's marital status, educational level, distance of health facility to the village, and husband's occupation, were factors associated with ANC utilisation,while use of institutional delivery was mainly associated with parity, education, having received ANC advice, a history of difficult/prolonged labour, and husbands' occupation (Tsegay, Gebrehiwot, Goicolea, Edin, Lemma and Sebastian, 2013). There is still a low utilisation of health care facilities by women in Nigeria during and after delivery and it has contributed to increased maternal morbidity and mortality. This could be as a result of demographicand socio-economic factors (Jibril, Saleh, Afolayan, Morisola, Umar and Abiola,2017).

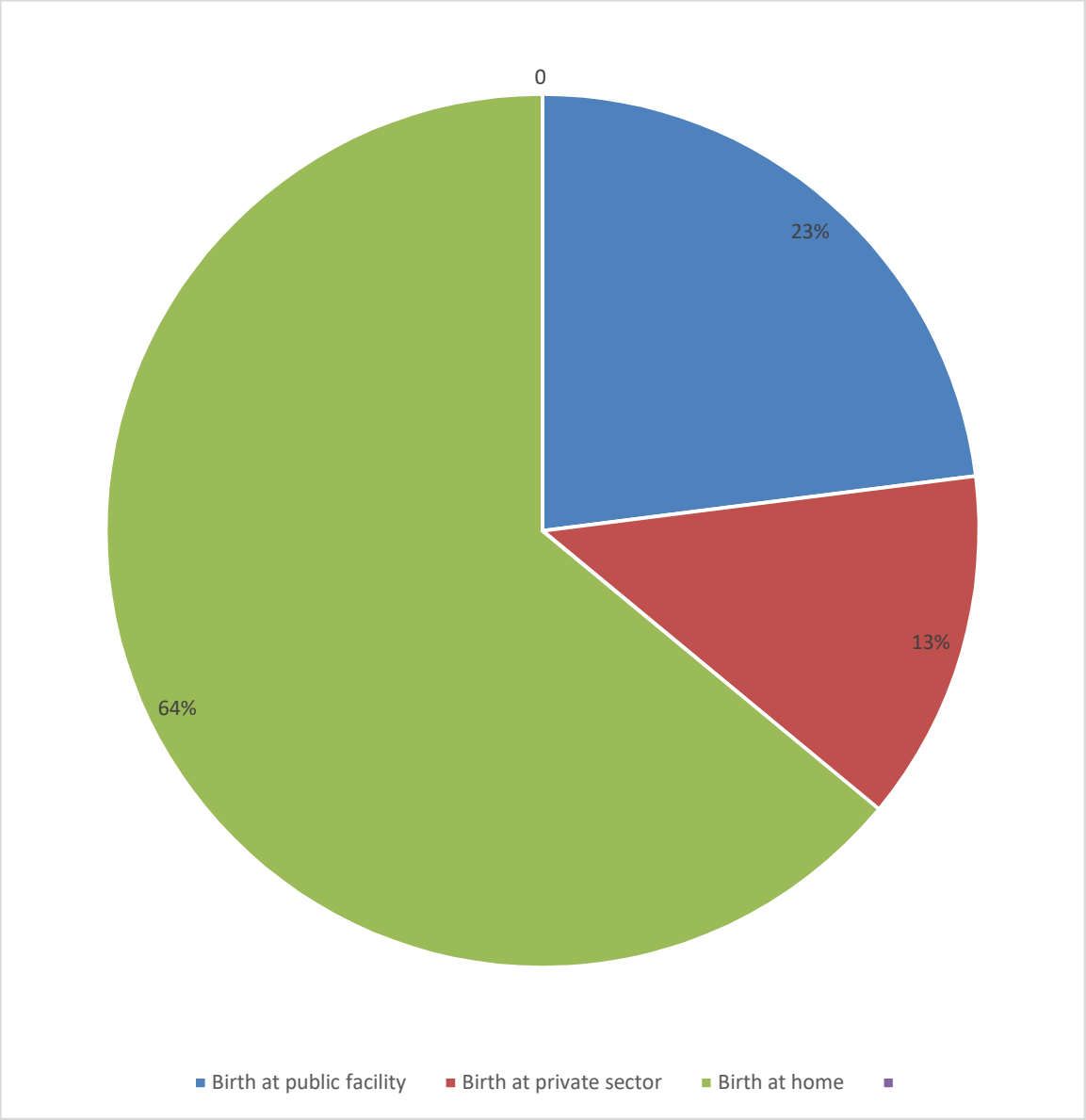

FIG: 2.2: Mother's choice of place of birth NPC and ICF, 2014

2.15 Barriers of adherence to ANC and utilisation of delivery services:

The poor maternal and child health statistics in Nigeria have been identified to be caused by many factors. Utilisation and low access to quality health care services were due to low literacy level, poor healthcare practices, inadequate skilled human resources, funding issues, low awareness and distance from healthcare centres especially in hard to reach communitiesamong others. Upgrading the Primary health Centres (PHCs) in very remote areas according to Olawale (2015) and drastically reducing maternal and infant mortality rate caused by Traditional Birth Attendants are contributing factors which may not be receiving the desired attention.

There are high ANC record attendance in all the community facilities but delivery records are terribly low. In a month, only three women went for delivery in a health facility where over twenty women attended ANC. The health care provider explained that the women only showb up at the health facility when there is complications or for immunisation (Olawale, 2015). Childbirth with TBA's according to Youth Hub Africa has been known to be contaminatered due to use of unsterilised tools, unskilled personnel, poor environmental conditions and little or no knowledge of prevention of mother-to-child transmission, hence increasing maternal and infant mortality and mother-to-child transmission of Human Immunodeficiency virus (HIV) rates. It was revealed by the health professionls that religious leaders and cultural beliefs lead to high patronage of TBA'sin some communities. To ensure that women and children are not at risk, there should be revisitation of the roles TBAs play in maternal and child health needs across the country (Youth Hub, 2015).

Another study by global health next generation network(2016) showed that some perception of pregnant women about midwives which is a contributing factor why rural women prefer TBA's to hospital midwives include perception of fear and punitive treatment, poverty in rural poor settings, tracking to hospital in cases of long distances and insufficient health care facilities. It was observed that the health facilities in the villagesrequest that pregnant women attending delivery with skilled attendant provide all the sanitary items necessary for the delivery like towels, soaps, disinfectants, sanitary pads and many more. Becauseof poverty,the women are unable to provide all the items needed andthis puts tension on these women and scares them away from hospitals. Pregnant women in rural communities opt for TBA'sbecause of all these

factors put together and the women are sure the TBA will not be strict on them during delivery of their babies.

All the respondents in a study by Mason, Delicour, Ter Kuile,Ouma, Philip-Howards, Were, Laserson and Desai (2015), agreed that the best and safest place to deliver is in a health facility but there are some factors that can influence a woman's choice of place to deliver. These factors were accessibility of health facilities, influenced by the woman not knowing when labour will start and transport to the health facility. Also, cost of facility based delivery care, husband's preference, health facility staff attitudes and previous experiences and habits. In addition the timing combined with distance to health facilities, played a critical role in determining where women deliver. These, were the reasons women gave for prefereing TBAs to health facilities in this study.

In another study on why women fail to give birth at health facilities, results showed that women saw being shouted at and delay in receiving care, as poor care. The respondents in the study expect the health professional to be tender not to shout at them while providing care. Even when the ANC was opened late the respondents saw delay in the provision of care as wasting of their time. Other challenges that make them not to utilize delivery services was time of labour (especially in the night and during the rain). Also, confidentiality by birth attendants,making sure that anything that happened during delivery was not related to a third party, behaviour and approach of health professionals. Respondents who delivered at TBAs reported that they were given special treatment and care when they went for delivery. Even though the strategy has proved useful in addressing many problems in pregnancies and ensuring safe births, profound barriers to ANC utilisation continue to exist in many locations due to the interactions of socioeconomic influences (such as accessibility, cost) health service-related factors (such as lack of trained staff and other resources) and a diverse array of cultural beliefs and practices (Kumbani et al 2013).

2.16Benefits of adherence toANC and utilisation of delivery services

The best and effective way to reduce maternal mortality and morbidity, is a health facility based delivery. High maternal mortality and morbidity are caused by low utilisation of obstetric care during pregnancy, labour, delivery and postpartum periods (Newell, Spillman and Newll,

2017).To reduce maternal mortality by 75% by 2015, Millennium Development Goal 5 (MDG-5) was in response to the thousands of maternal deaths from preventable and treatable causes and through providing universal access to reproductive healthcare. Since 1990, an estimated reduction of 45% was made in maternal mortality globally.Also there was an increase to 71% in 2014compared to 55% in 1990(Newell, Spillman and Newll, 2017).

In the period following delivery, improved health results for the mothers and the babies were connected to hospital based deliveries. In children between 12 to 23 months, hospital based delivery is associated with full vaccination and BCG immunisation(Moyer, Benyas and Rominski, 2016). There is still low uptake of facility based deliveries,despite the benefits. This is as a result of complex and context specific reasons, which transform the causes of maternal mortality from a number of treatable and preventable medical conditions to a wide range of complex, interlinking socio-cultural factors.

Before receving a facility based delivery, the women must logically access the hospital and the decision of going to the hospital must be made by the women, or a member of their family. It is therefore important to understand the factors that encourage Facility Based Deliveries and those that act as barriers, to fully secure the benefits of the increasing availability of reproductive healthcare brought about by MDG-5 (Newell, Spillman and Louise-Newll, 2017).

2.17Strategies to DecreaseMaternal Mortality in Nigeria

Nigeria Midwifery Service Scheme (MSS)

Regarding maternal and child health outcomes,Nigeria had a very poor record in 2009 according to National Primary Health Care Development Agency (NPHCDA). The MSS was established as a public sector collaborative initiative, for mobilising and deployment of bothnewly qualified, unemployed and retired midwives, for primary health care facilities in rural communities. Their aim of reducing maternal, newborn and child mortality,was the introduction of increased coverage of Skilled Birth Attendance (SBA) (WHO and NPHCDA, 2017).

Establishment of the Midwives Service Scheme (MSS)wasunder an Appropriation Act. The three levels of government in Nigeriacollaborated to start the MSS.A memorandum of understanding between the Federal, State and Local governments which sets out clearly defined shared roles

and responsibilities supportedthe strategic partners of the MSS. The 36 states in Nigeria signed the MOU designed for deployment, to selected primary health care facilities in rural communities,newly qualified, unemployed and retired midwives. Their focus is on decreasing maternal, newborn and child mortality by facilitating a rise in the coverage of Skilled Birth Attendance (SBA)(WHO and NPHCDA, 2017).

A Technical Working Group (TWG) that meets regularly does the job of providing strategic direction, support and guidance for the implementation of the MSS by receiving updates, reviewing progress and advice. For each state, the advocatesfor the midwives in the MSS are the states focal persons while the secretariat is responsible for the daily management.A General hospital with the capacity to provide Comprehensive Emergency Obstetric Care (CEOC) for MSS are surrounded by four(4) selected primary healthcare facilities with the comprehensive facility to provide Basic Essential Obstetric Care (BEOC).This is called a cluster model(WHO and NPHCDA, 2017).

The main function of MSS is to provide a 24 hours MCH services and make sure that health professional conducts all deliveries, to reduce maternal, newborn and child mortality and morbidity and ensures deployement ofa midwife to each selected PHC.Presently 163 general hospitals is surrounded by 652 PHCs, and covers 163 MSS clusters. To the 652 facilities, MSS basic equipments, comprising of midwifery kits, BP apparatus etc. are to be distributed via the vaccine logistics system and its focus is to strengthen the PHC system.The ward development committees were established/reactivated at all MSS PHCs. This is to make sure that there is community participation and ownership in its implementation of MSS. The midwives that were successful out of the number that applied for MSS were 2,488 and they were posted to PHC facilities (WHO and NPHCDA, 2017).

Orientation was given to the midwives to acquaint them with the scheme. The number of midwivesposted to PHC facilities in rural areasas of July 2010 was2,622. A training framework was conceptualised by MSSto provide capacity building and the goal is to improve provision of quality maternal and child health services bymaking the midwives skillful and proficient in their work. The midwives then underwent competency training with the help of Principals of Schools of Midwifery in Nigeria. The plans of MSS was to improve communication by articulating a measurement and evaluation framework for the scheme in order to implement ICT support for

the programme.Through some communication means like radio/TV, billboards, community outreach, health centre branding and posters, MSS have established a two-pronged approach to communication programme aimed at political leaders/decision makers and clients(WHO and NPHCDA,2017).

Difficulties faced by MSS in Nigeria: They are five, namely:

- Memorandum of UnderstandingImplementation,
- Skilled MidwivesAvailability,
- MidwivesMaintenance,
- BuildingMidwives Ability ,
- Sustenance of linkages.

Bymaking the objectives and aim of MSS clearer and easy to understand,the support and commitment from officers in relevant government departments will be achieved(WHO and NPHCDA, 2017). The programme is funded by thedebt relief granted to the Nigerian government by the Paris Club. The doubt abount the funding of MSS after the 3 year commitment from the grant is the greatest problem the programme faced.

Each state government is to fully participate in the MSS programme because they are to take over the scheme gradually. The MOU engaged with state and local governments.Implementation was a problem that was continuously being faced in the programme. Included in the MOU were provision of accommodation, state and local government'sirregular or delayed salary payment for the MSS midwives. To compel the stateand local governments to carry out their roles for MSS programme, they put in place field agents from the NPHCDA to monitor the PHC facilities and midwives regularly.

The main hindrance to the success of the scheme is in areas where there are increased need of qualified midwives, e.g. the North East and North West. To overcome the problem, more midwives were employed and posted to these areas. Keeping the midwives in their job is a major problem the scheme faced. About forty four percent (44%) of the MSS midwives are young, single, or newly married. Majority of the midwives, after the one year mandatory training, go back to their homes, especially those from the southern zones (WHO and NPHCDA, 2017).

The compulsory pre-registration programme, inadequate social amenities, language barriers between the midwives and the local community, and working in hard-to-reach rural areas were the major factors that dragged the programme back. To overcome the problems, the organisers of the programme put in place some strategiesand incentives like attractive pay package and provision of ambulances, accommodations, and health insurance coverage for the midwives. Additional 1,000 CHWswere sentto some hard-to-reach areas in the North Central, North East, and North West respectively. To provide support and supplement the work of the midwives,two CHWs were posted to each PHC. They were told to refer appropriately identified women and children who need care from their community assessment. A long-term plan was the identification and training of localsto become midwives who will then work within their own communities. There are ongoing discussions as part of MSS,around providing supervised home delivery,especially for pregnant womenin northern Nigeria, who present for ANC, but choose to deliver at home for sociocultural reasons (Abimbola, Okoli, Olubajo, Abdullahi and Pate, 2012).

According to Abimbola, Okoli, Olubajo, Abdullahi and Pate (2012), there should be additional training on PMTCT, family planning, and information and communications technology (ICT) skills instead of the current LSS and IMCL only. Their scope of knownldge should be beyond just midwifery, there should be capacity building also.

In their write up on saving women's lives, the Family Care International (2013)in their study in Kenya, observed in their study that almost all their participants agree that the hospitals were the best source of medical care during ANC, delivery and post partum.Also, the research workrecognised some factors that limit women’s utilisation of health care professionals during pregnancy, delivery, and the postpartum period. These factors include:

- The cost of hospital based delivery care and the women’s perception about the capacity of health facilities,
- The attitude of health care professionals towards community members was a big concern,
- Inability of the women to access hospital based delivery care,
- Planning and preparation for delivery is lacking (Abimbola, Okoli, Olubajo, Abdullahi and Pate, 2012).

GOBI-FFF

Growth Monitoring

Before the child begins to manifest malnutrition, growth monitoring should help the mothers prevent it. Majority of the mothers are doing their best even within theirlimited resources, with 10 cent growth chart and basic advice on weaning, most infant's were maintained on a healthy growth. Over 80 countries will receive more than 200 different growth charts(UNICEF's GOBI-FFF Programs, 2014).

Oral Rehydration

With effective use of oral rehydration over 4 million young children could be saved from dying from diarrhoel dehydration. Dehydration caused by ordinary diarrhoea in the developing worldkills one out of every 20 children born,before the age of 5. Also, it is of note that the biggest single cause of child deaths in developing countriesis dehydration. The previous treatment for dehydration which is the intravenous feeding of a saline solution was expensive for the people who needs it. Presently,intake of solution of salts, sugar and water administered by the mother in the child's own home can rehydrate the child. Oral rehydration is one of the simplest but most important breakthroughs in the history of science and ORT has saved most children (UNICEF's GOBI-FFF Programs, 2014).

Breast-Feeding

To ensure that the baby takesthe best possible food and a considerable degree of immunity from common infections, breast feeding for the first six months of life is very important. It is important for the mothers to note that breast milkoffers a degree of immunity from infectionsfor infants, also it has more nutrients and it is hygienic. Breast feeding is time consuming, restrictsmovement, it is economical for the mother, but makes heavy demands on her energy (UNICEF's GOBI-FFF Programs, 2014).

Immunisation

The child is given vaccine immeadiately following birth till 9 months after which booster doses are administered. These vaccines protect the child from some killer disesaes of under 5 e.g. measles, diphtheria, whooping cough, tetanus, tuberculosis, and polio. It has been discovered that

these ailments are the main causes of malnutrition in children.They are the major causes of disability in about 5 million children and another 5 million have been killed by these disaeses.
Current studies have shown that women in developing countries need support to overcome some of the challenges they are facing. The three F's is used to indicate the changes.

Female Education

It has been revealed that educating a mother plays an important role in the life of the child. Children of women from low-income communities and without education are twice likely to die in infancy than children from educated women in the same environment.

Family Spacing

When the period between two deliveries is less than 2 years,the child or infant's death has been found to be twice as higher(UNICEF's GOBI-FFF Programs, 2014).

Food Supplements

In some pregnant women, the risk of low birth weight has been reduced due to increase in intake of food supplements. There are two or three times greater likelihood of death in infancy in women who are at risk.

Safe Motherhood Initiative

Safe motherhood initiative was launched in 1987 at Nairobi. Pregnancy and childbirth associated death and illnesses have been a major problem worldwide, so safe motherhood initiative has the goal of reducing the number of death and illnesses. The world attention was drawn to the countless deaths and serious complications that occur every year among mothers. The Safe Motherhood Inter Agency Group (IAG) co-sponsored the conference in Nairobi(Maternity Worldwide, 2015).

The goal of this initiative is to make sure that the health of the most vulnerable women and newborns are promoted. Safe Motherhood and Newborn Health,establishedan expanded Partnershipin January 2004 to meet this goal.The Partnership aims to strengthen maternal and newborn health efforts at the global, regional, and national levels, in the context of equity, poverty reduction, and human rightsbased on expanding the scope of the global Safe Motherhood Initiative and building on the work of the Safe Motherhood Inter-Agency Group. The Partnership

undertakes the following activitiesfocusing on the areas of advocacy /information-sharing, technical advancement, and countrylevel support and partnership;

- Refocusing world attention on refining women and newborns health in developing countries by utilising advocacy/media strategies.
- Emphasising the importance of safe motherhood/newborn healthat national level, giving it a place within national development plans and aid requests
- Improvingeffective interventions on application of technical knowledge and research findings (Maternity Worldwide, 2015).

2.18Health education

It helps in promoting health, increasing knowledge or influencing attitudes of individuals and communities by using combination of learning experiences. By health educating, the pregnant women is to allow them to have control and make changes in their lifestyles thereby improving their health. One strategy of health education ishealth promotion which helps individuals learn and use health-enhancing skills appropriately (WHO, 2017).

ANC health education, which can promote the health of the mothers and those of their babies before and after birth, is given to the mothers on the benefits of good nutrition, adequate rest, good hygiene, family planning, exclusive breastfeeding, immunisation and other disease prevention measures.

The Nurse asHealth Educator (HE)

The nurse health educator is a specially trained professionalwho serves in a variety of roles. He/She uses appropriate educational strategies and methods to facilitate the development of policies, procedures, interventions, and systems conducive to the health of individuals, groups, and communities (Joint Committee on Terminology, 2014). Obligationof a nurse health educator:

Obligation I: Evaluatingif HEis needed by theIndividual and Community

- Program planning foundationprovision
- Determination of what health problems might existin any given group

- addressing the problem and determination of community resources available
- Health problemsownership by the population(Community Empowerment)
- Analysisafter careful data collection

Obligation II: Interventions, Programs,Strategies of HEDesign

- Always make the base of actionsthe community needs assessment
- Specific and measurablegoals and objectives are developed
- Goals and objectives with the development of achiviable interventions
- Implementationof strategiesthat are robust, effective enough, and have a reasonable chance of meeting stated objectives,according to Rule of Sufficiency

Obligation III: Strategies, Interventions, and ProgramsImplemention in HE

- The priority populationshould be thoroughly understood, that will form the bases of implementation
- Utilisation of extensivevariety of educational methods and techniques.

Obligation IV: Research and Evaluation Related to HEareconducted

- Depending on the setting utilise tests, surveys, observations, tracking epidemiological data, or other methods of data collection in your study
- Their practiceof Health Educatorsis improved by research.

ObligationV: Strategies, Interventions, and Programsof HEshould be administered

- Administration of function of the more experienced practitioner
- It involves facilitating cooperation among personnelboth within and between programs

ObligationVI: Resource Person for HE

- To establish effective consultive relationships which involves skills to access needed resources

ObligationVII: For Health and Health Education there is need to communicate and Advocate effectively

- They have to translatescientific language into understandable information
- In diverse settingstry to address the diverse audience
- Policies,support rules, and legislationshould be formulated
- Health education profession should be advocated for (Joint Committee on Terminology.2014)

Health education gives constructed opportunities for learning for everyone. It also provide communication designed to improve health literacy.In addition,it develops and improves individual's knowledge and life skills which is needed for their health and that of the community.

In the context of the nurse's obligation as a health educator what is the main focus of ANC to pregnant women. The nurse should make sure that Health education received by the women will help them to make informed decisions in relation to the outcome of their pregnancy.Also, the nurse should note that some women will have difficulties in changing their lifestyle.

Barriers to effective health educationcan be categorized as follows:

- Inability to hear and see(Physical barriers),
- Normal skills, household environment or education that disturb the perception and understanding of the receiver. (Intellectual barriers),
- The psychological status of the educator and eagerness, preparadness or eagerness of the receiver.(Emotional barriers),
- A noise polluted area or a room, that is choked(Environmental barriers),
- Traditions, beliefs or religious attitudes that may pose as difficulties(Cultural barriers),
- Difficulty to overcome language and agedifferences, financial and social class differences.

The educational status, whether too low or too high, of the educator (sender) and the audience (receiver)may affect communication.Note that all these barriers can be minimising butcannotbe avoid during health education (Joint Committee on Terminology, 2014).

2.19Home Visit

In developed countries, there are agencies that supervise home visits and providenurses on request for home care: to establish and evaluate health problems through combining the public health nursing effort and other health professionals in taking care of the family and the community, to promote family understanding and acknowledgment of problems,to provide nursing services that cannot be providedby the family,to provide emotional support in times of stress, to develop the competence of the family or individuals to think through and cope with their own problem, if their coping mechanism is effective.(Through activities,the personal and

social development of the individual and familycan be upgraded,to influence modification in the client's environment in order to promote safety, to provide information for family and individuals on resources available for health maintenance and health promotion as well as encourage a wise use of such resources(Duggan, Latimore, Burrell, Crowne, Ojo, Cluxton-Keller, Gustin, Kruse, Hellman, Scott and Riordan, 2017).

Indication for Home Visit in Contemporary Society

- When a client keeps having a recurrent problem e.g. diarrhoea, malaria, bleeding.
- When a client is not making good progress
- When there is need to involve additional members of the family in the care.
- When a client has just been discharged home either from primary, secondary and tertiary health institution.
- Absenteeism
- Chronically ill client being nursed at home
- Terminally ill client being cared for at home
- Bereavement
- Referral from primary, secondary or tertiary health institution
- Invitation by the family
- Antenatal and postnatal client

Types of Home Visit

1. Routine home visit
2. Special home visit, (Duggan, Latimore, Burrell, Crowne, Ojo et al 2017).

Phases of Home Visit

Contracting Phase: It is the first phase of home visit. This encompasses the antecedent evidence. That is the evidence that makes the nurse aware of the individual or family who is identified as needing or desiring a visit.It also includes the 'GOING TO SEE' PHASES which is the travelling time for the nurse to the home of the client as well as the period for getting information about the neighbourhood and the family place in the neighbourhood.

Entry Phase: It could be referred to as the SEEING PHASES.To ensure the success of this phase the nurseis expected to utilise the nurses' strategy to ensure trust. During this phase the nurse has tointeract,learn about, and plan intervention with the family concerned.

Termination Phase: The success of this phase is dependent on the success of the first and second phases. This encompasses the TELLING PHASES. Which emphasises- documentation of the situation, evaluation of interventions, further plane for future visit and referral of the client when indicated. It is usually assumed that home visit will provide intervention that will support family life. However, in some situations, home visit can have negative consequencessuch asstigmatising the family as poor or neglecting their child. It is therefore very important that during home visit family strengths are emphasized rather then focusing on the negative aspects (Duggan, Latimore, Burrell, Crowne, Ojo et al 2017).

Reminder calls: Phone calls andshort message service (SMS)sent to the participant before the ANC clinic to remind her of the day and time for her antenatal clinic. SMS is the most widely used type of text messaging in which message of up to 160characters can be sent to another device. SMS was used in the study for the literate participants only. While phone calls were used for all the participants that were not regular at ANC.

2.20Summary of Literature Review

The literature showed the historical and global views of ANC and delivery services. The diagnosis and physiology of pregnancy were reviewed. Also, the reviewed literature showed that MMR in developing countries is at the increase unlike in the developed countries. Major causes are due to non-adherence toANC and low-utilisation of delivery services by pregnant women. Other causesof maternal death are complications during pregnancy like bleeding, infection, pregnancy induced hypertensio, obstructed labour, unsaved abortion, anaemia and other direct and indirect causes. Reviewed studies showed that with adherence to ANC and utilisation of delivery servicesby skilled health personals,maternal morbidity and mortality during pregnancy and birth will be a thing of the past in low-income countries because most of the causes are avoidable. Most of the literaturesmentioned accessibility, affordability, availability, information, attitudes, beliefs and culture, the placeof women in the household and society as the causes of

maternal mortality.There was no current literature on using reminder calls and home visits to decrease marternal mortality in developing countries.

Relising the world wide plan to reduce maternal death to 70 per 100,000 live births by 2030 requires a world wide annual rate of reduction of at least 7.5%, which is twice the rate achieved between 2000 and 2015. In 2016, provision of adequate ANC in pregnancy and professional care in delivery and post partum lead to prevention of most maternal deaths. It is of note that only half of live birth benefitted from skilled care in sub-Saharan Africa(United Nation, 2017).

2.21Conceptual framework

Health promotion model (HPM) proposed by Nola J Pender (1982; revised, 1996cited in Pender et al, 2006)and Interaction model of client health behaviour by Cox (1982) cited in Pender et al (2006)were used for the study. The health promotion model

- Describes, health as "a positive dynamic state not merely the absence of disease".
- Holds that Health promotion is directed at increasing a client's level of wellbeing.
- Describes the multi-dimensional nature of persons as they interact within their environment to pursue health

The conceptemphases were on three areas:

- · Individual characteristics and experiences
- · Behavior-specific cognitions and affect
- · Behavioral outcomes

In health promotion model, each person has unique personal characteristics and experiences that affect subsequent actions. Important motivational significance has a set of variables for behavioral specific knowledge and affect. Nursing actions can be used to modifythese variables. The end point in the HPM is health promoting behavior whicn is the desired behavioral outcome. At all stages of development,health promoting behaviors should result in improved health, enhanced functional ability and better quality of life. The final behavioral demand is also influenced by the immediate competing demand and preferences, which can derail an intended health promoting action(Pender et al, 2006).

Assumptions of the Health Promotion Model

1. Individuals seek to actively regulate their own behaviour.
2. Individuals in all their bio psychosocial complexity interact with the environment, progressively transforming the environment and being transformed over time.
3. Health professionals constitute a part of the interpersonal environment, which exerts influence on persons throughout their life span.
4. Self-initiated reconfiguration of person-environment interactive patterns is essential to behavior change

Theoretical Propositions of the HPM

The HPM is based on the following theoretical propositions:

1. Prior behaviour and inherited and acquired characteristics influence beliefs, affect, and enactment of health-promoting behaviour.
2. Persons commit to engaging in behaviours from which they anticipate deriving personally valued benefits.
3. Perceived barriers can constrain commitment to action, a mediator of behaviour as well as actual behaviour.
4. Perceived competence or self-efficacy to execute a given behaviour increases the likelihood of commitment to action and actual performance of the behaviour.
5. Greater perceived self-efficacy results in fewer perceived barriers to a specific health behaviour.
6. Positive affect toward a behavior results in greater perceived self-efficacy, which can in turn result in increased positive affect.
7. When positive emotions or affect are associated with a behaviour, the probability of commitment and action is increased.
8. Persons are more likely to commit to and engage in health-promoting behaviours when significant others model the behaviour, expect the behavior to occur, and provide assistance and support to enable the behavior(Pender et al, 2006).

9. Families, peers, and health care providers are important sources of interpersonal influence that can increase or decrease commitment to and engagement in health-promoting behaviour.
10. Situational influences in the external environment can increase or decrease commitment to or participation in health-promoting behaviour.
11. The greater the commitments to a specific plan of action, the more likely health promoting behaviors are to be maintained over time.
12. Commitment to a plan of action is less likely to result in the desired behaviour when competing demands over which persons have little control require immediate attention.
13. Commitment to a plan of action is less likely to result in the desired behavior when other actions are more attractive and thus preferred over the target behaviour.
14. Persons can modify cognitions, affect, and the interpersonal and physical environment to create incentives for health actions(Pender et al, 2006).

Major Concepts and Definitions

Individual Characteristics and Experience

Prior related behaviour: Frequency of the similar behaviour in the past. Direct and indirect effects on the likelihood of engaging in health promoting behaviours(Pender et al, 2006).

Individual Factors:Personal factors categorized as biological, psychological and socio-cultural. These factors are predictive of a given behavior and shaped by the nature of the target behaviour being considered.

Personal biological factors include variables such as age, gender, body mass index, pubertal status, aerobic capacity, strength, agility, or balance.

Personal psychological factors include variables such as self-esteem,self-motivation, personal competence, perceived health status and definition of health.

Personal socio-cultural factors include variables such as race, ethnicity, acculturation, education and socioeconomic status (Pender et al, 2006).

Behavioural specific cognitions and Affect

Perceived Benefits of Action**:**Anticipated positive outcomes that will occur from health behaviour.

Perceived Barriers to Action:Anticipated, imagined or real blocks and personal costs of understanding a given behaviour.

Perceived Self Efficacy**:**Judgment of personal capability to organise and execute a health-promoting behaviour. Perceived self-efficacy influences perceived barriers to action, so higher efficacy result in lowered perceptions of barriers to the performance of the behaviour.

Activity Related Affect: Subjective, positive or negative feeling that occur before, during and following behaviour based on the stimulus properties of the behaviour itself.Activity-related affect influences perceived self-efficacy, which means the more positive the subjective feeling, the greater the feeling of efficacy. In turn, increased feelings of efficacy can generate further positive affect.

Interpersonal Influences**:** Cognition concerning behaviours, beliefs, or attitudes of the others. Interpersonal influences include: norms (expectations of significant others), social support (instrumental and emotional encouragement) and modelling (vicarious learning through observing others engaged in a particular behaviour).Primary sources of interpersonal influences are families, peers, and healthcare providers(Pender et al, 2006).

Situational Influences:Personal perceptions and cognitions of any given situation or context that can facilitate or impede behaviour. Situational influences may have direct or indirect influences on health behaviour.

Behavioural Outcome

Commitment to Plan of Action: The concept of intention and identification of a planned strategy leads to implementation of health behaviour.

Immediate Competing Demands and Preferences: Competing demands are those alternative behaviour over which individuals have low control because there are environmental contingencies such as work or family care responsibilities.

Competing preferences are alternative behaviour over which individuals exert relatively high control, such as choice of ice cream or apple for a snack.

Health Promoting Behaviour; Endpoint or action outcome directed toward attaining positive health outcome such as optimal well-being, personal fulfillment, and productive living(Potterand Perry 2006).

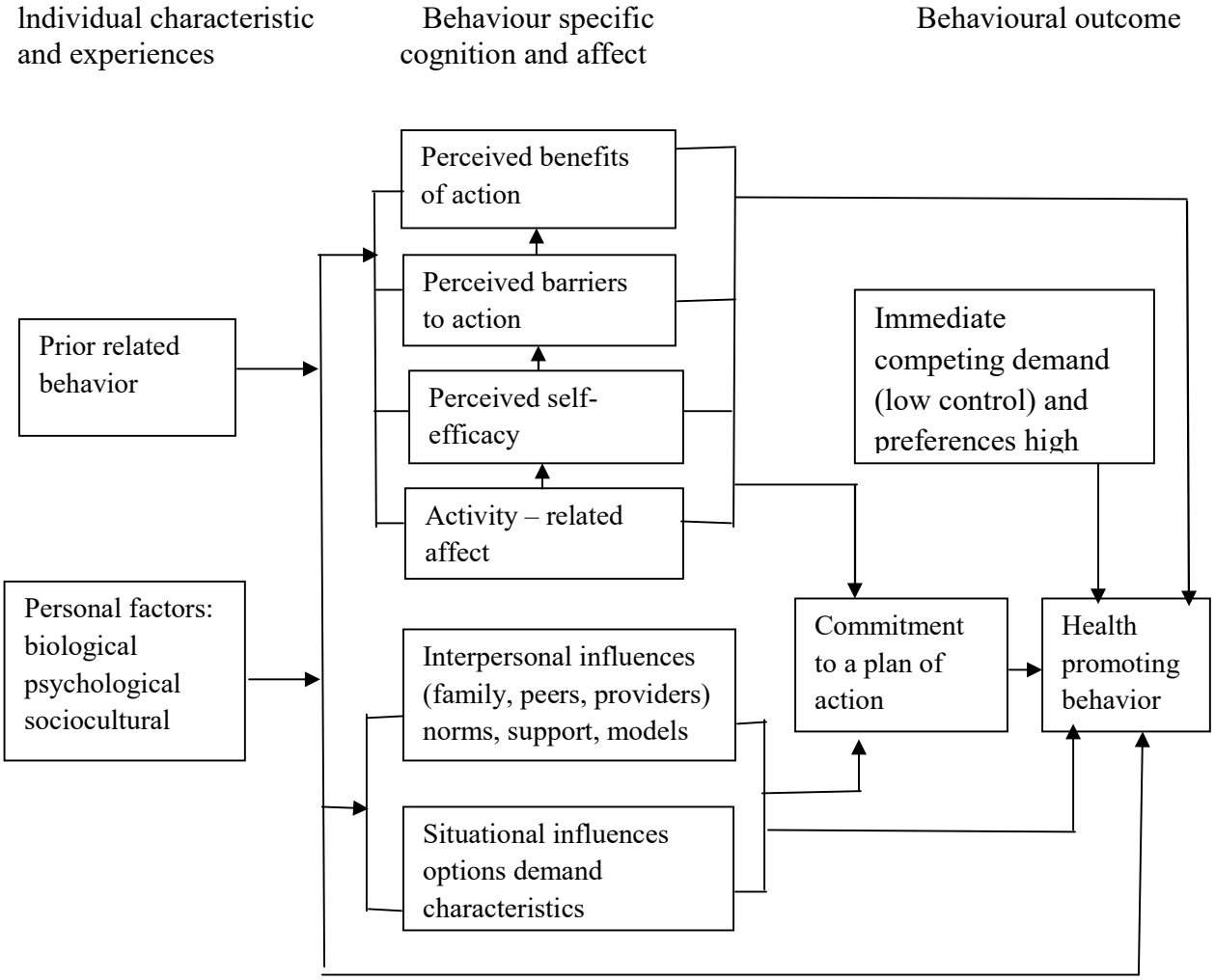

Fig 2.3: Health promotion model(Pender et al, 2006)

Interaction model of client health behaviour by Cox (1982) cited in Pender et al (2006) Interaction Model of Client Health Behavior (IMCHB) focuses on both characteristics of the client and factors external to the client to provide a comprehensive explanation of actions directed toward risk reduction and health promotion. Client background variables included in the model are demographic characteristics, social influence, previous health care experience, and environmental resources. These background variables and the intrinsic motivation, cognitive appraisal and affective response of the client in regard to a particular behaviour interface with elements of client-professional interaction (affective support, health information, decisional control, and professional-technical competencies) to affect health outcomes (Cox1982).

Based on the cognitive evaluation theory proposed by Deci and Ryan (1985), Cox (1985) indicated that intrinsic motivation, or doing an activityfor its own sake because of interest or positive cognitive or emotional response, is an important source of motivation for health behaviour. Critical health outcomes are the use of health care services, clinical health status indicators, severity of health care problems, adherence to the recommended careregimen, and satisfaction with care.

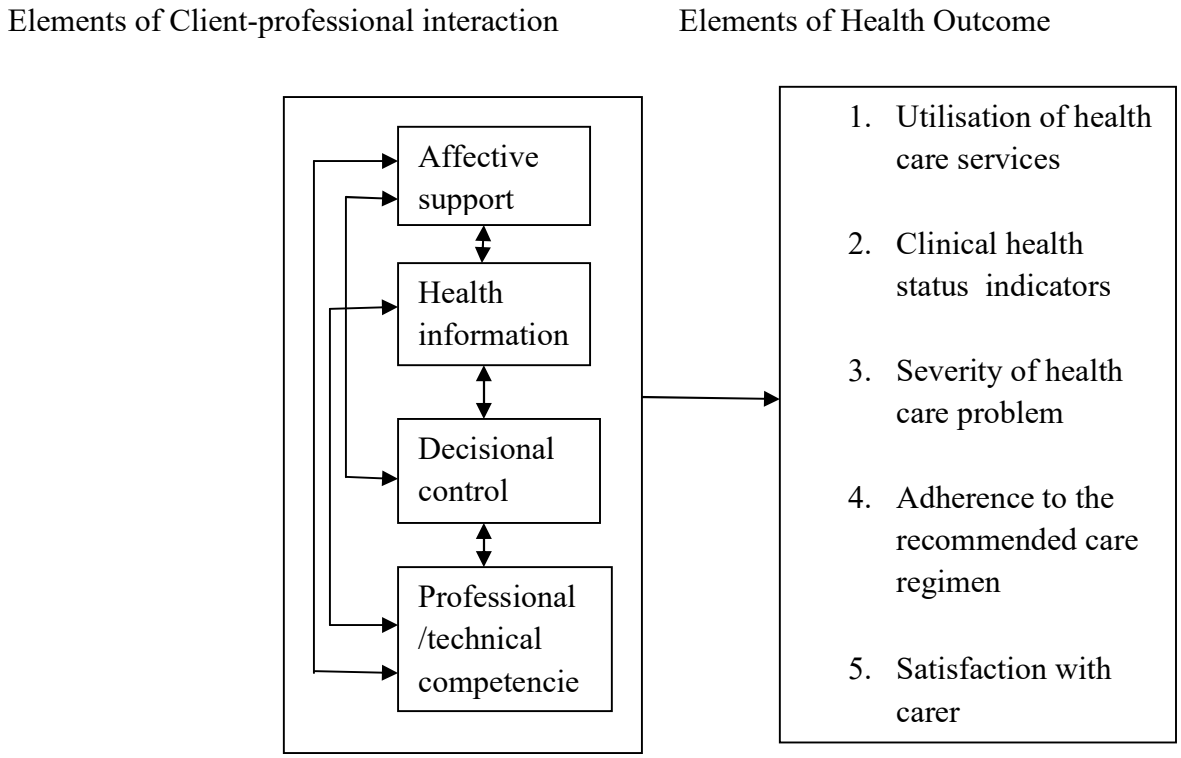

Figure 2. 4: Interaction model of client health behaviour(Cox, 1982)

Application of the conceptual framework to the study

The pregnant women's individual characteristic and knowledge of ANC is a product of experiences when primary health center was used. The pregnant women's knowledge influences their perceived benefit and barriers to ANC and delivery services also, their adherence to ANC and utilization of delivery services.

The educational intervention, reminder calls and home visits influenced their perception positively, leading to improved adherence to ANC and utilization of delivery services.

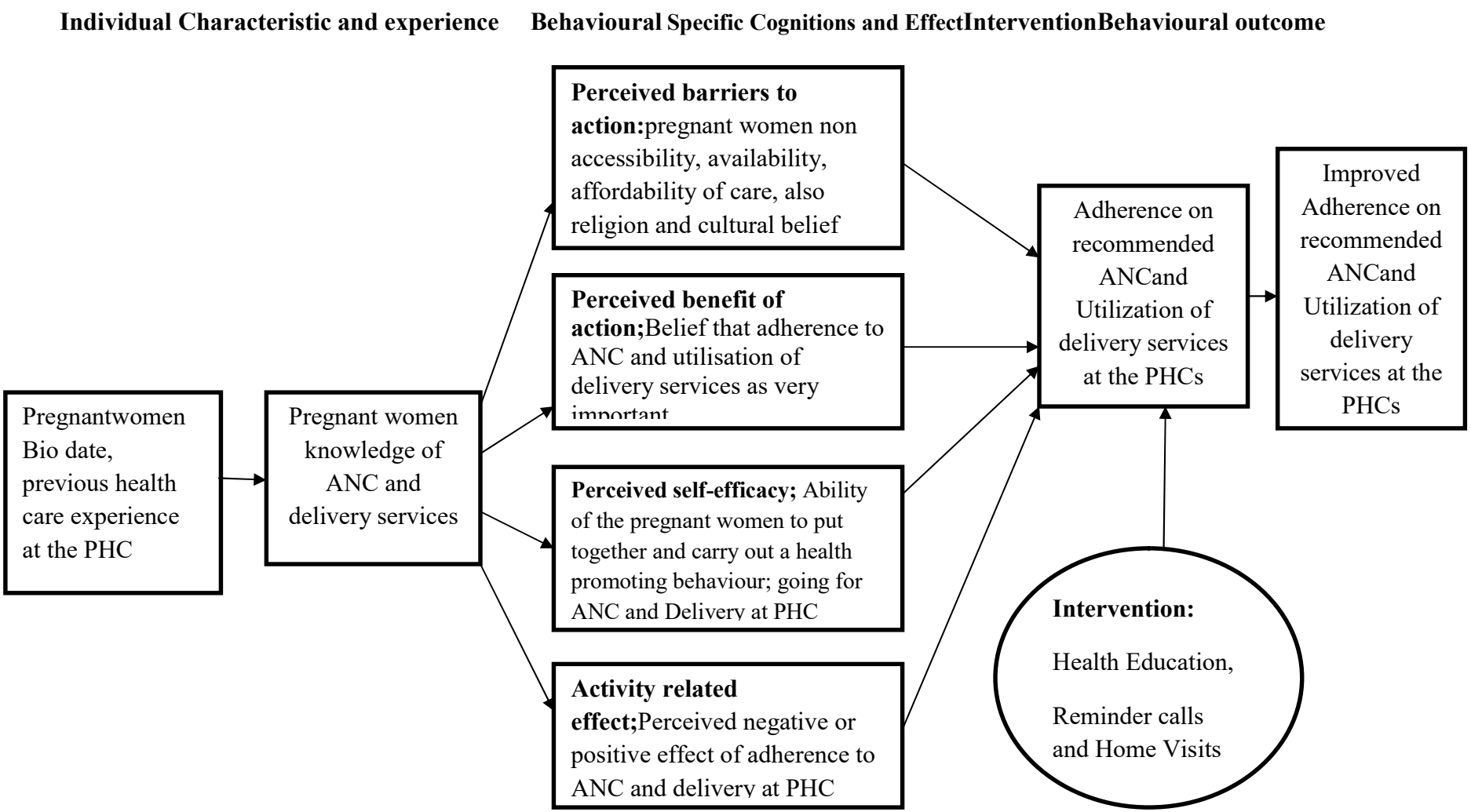

Figure 2.5 Conceptual Framework for Reminder calls and home visits on Adherence to ANC and Utilisation of Delivery Services. Source: Adapted from Cox's Interaction Model of Client Health Behaviour and Pender's Health Promotion Model(Cox,1982 cited in Pender, 2006)

2.22Hypotheses

1. There is no significant difference in knowledge and adherence to ANC among the pregnant womenpre and post intervention.
2. There is no significant difference in knowledge of delivery services between pregnant womenpre and post intervention.
3. There is no significant difference in the perceived benefit of adherence to ANC and utilisation of delivery services between the pregnant womenpre and post intervention.
4. There is no significant association between the intervention and the pregnant women's level ofadherence to ANC at 16^{th} week and post intervention.
5. There is no significantassociation between pregnant women's intention toutilise delivery services at pre and their utilisation of delivery services post intervention.

CHAPTER THREE

3.0Methods

This chapter presentsstudy design, study area/setting, population, sample and sampling technique,construction of the tools, ethical considerations, data collectionmethods and plans for analysingcollected data.

3.1 Study Design:

This research is an intervention study that employs a quasi-experimental design to assess the outcome of reminder calls, and home visits on ANCadherenceand utilisation of delivery servicesin PHCsin Lagos State. The design includes intervention and control groups. This ensures that there is comparison thathelps to determine the level of benefit of the intervention.

The participants were comparable as they were all pregnant women utilising primary health centers and are from similar communal and geopolitical locations. Intervention group participants were exposed to health education, reminder calls and were visited in theirhomesduring their first, second and third trimesters. Post intervention data were collected from the two groups after delivery. Before and after intervention result were compared to determine the effect of the intervention.

3.2 Area of Study: The study area was Lagos State. Itoccupies 3,345 square kilometers, suitated on the narrow plain of the Bight of Benin, which isin the South-Western part of Nigeria. It has boundarieswith the following: Republic of Benin in the west,and stretches over 180 kilometers along the Guinea Coast of the Bightof Benin on the Atlantic Ocean, Ogun State in the north-east of Nigeria.IBILE, representsthe five administrative divisions of Lagos state, they are Ikeja, Badagry,Ikorodu, Lagos and Epe.

Lagos State hastwenty Local Government Areas and 56 Local Council Development Areasfrom the Divisions. The state is heterogeneous but themajor language is Yoruba. Lagos is global,and socio-cultural, despite its Yoruba indigenes, Nigerians and foreigners stay together. The condition is because of itscomprehensive economic base, planned maritime location and socio-

political importance which increase the rate of migration to the state. There are four tertiary health facilities, 274 PHCs and 24 secondary health facilities in Lagos State.

Three of the administrative divisions with similar characteristic were selected for the study. Epe, Ikorodu and Badagry are the divisions that haveruralcharacteristic in Lagos State (Adeyemi 2014).There is no tertiary health facility located in these divisions. The secondary health facilities are seven and the functional PHCs are 124. The rural and sub-urban areas have less PHCs in Lagos State. Other sources of care include traditional healers, traditional birth attendants and faith based care (mission homes).

Twelve purposively selected primary health centers in Lagos State were used for the research. Choice of the health facilities was informed by the availability of midwifery service scheme at the PHCs. Most women in the rural and sub-urban areas receive care from PHCs. Also because PHCs are the corner stone to health as stipulated in the National Health Policy for Nigeria. It is the first contact for most mothers seeking ANC. The PHCs include four from Ikorodu, two from Epe and six from Badagry administrative divisions.Ikoroduhas a population of 535,619 in 2006 Census (The World Gazetteer,2007). Ikorodu has 30 political wards, 23 primary health centers, and sixLocal Council Development Area (LCDA). The estimated monthlynumber of ANC attendees that fall within the inclusive criteriain selected PHCs was about 98 in lta-ElewaPHC,94 in lpakodo PHC,90 inOke-eletu PHC, and 84 in Imota PHC.

Four local government areasmake up Badagry division: Ojo with a population of 598,071, Amuwo-Odofin with 598,071, Ajeromi-Ifelodun with684,105 and Badagrywith 241,093. Badagryalso serves as the divisional headquarters.The six selected PHCs estimated monthly number of ANC attendeesthat fall within the inclusive criteria were about 85 in Seme PHC, 85 in Ilado PHC, 80 in Ilogbo PHC, 80 in ApaPHC, 95 in Ajara PHC and 80 in Marina PHCs.

Two local government areasmake up Epe division: Epe with a population of 498,089 and Ibeju-Lekkiwith a population of 687,068 with the divisional headquartersat Epe.This division lies about 89kms North-East of the City of Lagos. The two selected PHCs estimated monthly number of ANC attendeesthat fall within the inclusive criteria were about 80 in Epe PHCs, and 85 in Eredo PHCs.

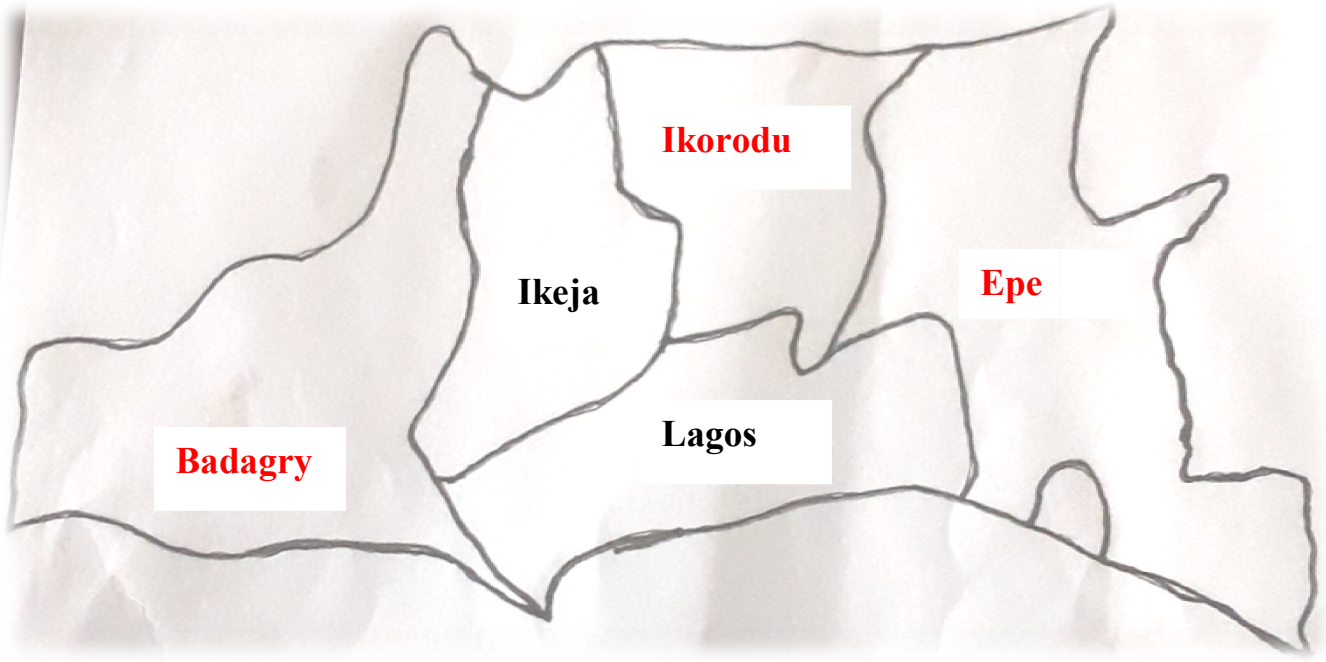

Fig: 3.1
Map of Lagos State Showing the setting source: Adeyeye S.A.O 2015 Researchgate.net

Table 3.1 Selected Primary Health Centres

Primary health centre	Intervention	Control
Ikorodu	lta-Elewa, lpakodo, Oke-eletu, Imota,	
Epe	Epe, Eredo	
Badagry		APA, Seme, Ajara, Marina, Ilado,Ilogbo

3.3 Population

Target population: They were all pregnant women in their first trimester utilising ANC in Lagos State.

Study population: These include the pregnant womenin their first trimester using the selected control and intervention PHCs in Lagos state.

3.4. Sample sizedetermination: The formula for comparing groups was used for the calculation. According to Taylor (1983), the formula is:

$$n = \frac{2(Z\alpha + Z\beta)^2 p(1-p)}{(P_1 - P2)^2}$$

Zα = the normal deviate corresponds to the 95% confidence interval = 1.96

Zβ = the standard deviate corresponds to 99% confidence interval = 2.58

P2 = baseline % of pregnant women who utilise ANC in theCG =0.77 (Gupta, Chhabra, Kannan and Shama, 2010).

P1 = pregnant women% who utilise ANC in the IG= 0.92

$$n = \frac{2 \times (1.96 + 2.58)^2 \times 0.85 \times (0.15)}{(0.15)^2} = 233.6$$

To allow for 20% non-response. 233.6 = 279.5 approximately 280

The total number of estimated attendees in the control group PHCs were 505 while attendees for the intervention group PHCs were 527. In view of this, the participants were distributed using the baseline proportion for control and intervention to ensure coverage of the attendees.

For control group = 0.77 x 280 = 127.7 approximately 128 respondents

1.69

For intervention group = 0.92 x 280 = 152 respondents

1.69

Intervention group sample size: 152 pregnant women, control group 128 pregnant women.

Table 3.2 Distribution of respondents

S/NO	**Intervention**	Pregnant women	**Control**	Pregnant women
1	lta-Elewa PHC	28	Apa PHC	26
2	lpakodo PHC	26	Seme PHC	21
3	Oke-eletu PHC	24	Ajara PHC	18
4	Imota PHC	28	Marina PHC	20
5	Epe PHC	20	Ilogbo PHC	20
6	Eredo PHC	26	Ilado PHC	23
7	**Total**	152	**Total**	128

3.5 Sample and sampling technique: Twelve comprehensive PHCs wereselected for the study. The twelve PHCs were from the three administrative divisions because they are midwifery service scheme centers. Twelve PHCs were selected because the study entails intervention and monitoring of the paticipants to determine the final outcome. Ikorodu and Epe LGA were randomly selected as intervention PHCs by balloting, while Badary LGA was the controlPHCs.At each facility systematic sampling method was used to select participants so that they can be given equal chances of being selected. At each PHCs,the bases for sampling wasan estimate of pregnant women attending ANC. Each woman was given a number as they arrive for ANC registeration at the PHCs and this number was used for the selection.

K = N/n where N =1032 and n= 280.1032/280 = 3.68 i.e interval of 3 was used.

On each ANC day, the interval of three was used to select pregnant women who came for ANC. They were recruited and informed about the study, after which consent was obtained.Calculated sample size in each group was used for proportional allocation.

Distribution of respondents at PHCs = Sample sizeX Estimated attendees at PHC

Total estimated attendees

3.6: Inclusion criteria: Participants, who were in their first trimester. Participants, who registered for ANC at any of the selected PHCs in Lagos State. Participants,who are willing to sign the consent form.

Exclusion criteria: Grand multigravida, elderly primigravida and short staturewomen because they are not suitable for primary health centre delivery. Pregnant women who have participated in other related studies. Pregnant women who are unwilling to sign the consent form.

3.7: Instrument development: The instruments for data collection consist ofstructured questionnaire, which was developed after focused group discussion.It has six sections.

- Section A: questions on socio- demographic data of the participants.
- Section B 1and 2: questions on knowledge of ANC and delivery services in PHCs.
- Section C 1 and 2: questions on adherence to ANC(adopting Morisky Adherence Treatment Scale (MMAS-7)and utilisation of delivery services in PHCs.
- Section D1 and 2: questions on perceived barriers onadherence to ANC and utilisation of delivery services in PHCs.
- Section E:questions on perceived benefitson adherence toANC during pregnancy in PHCs.
- Section F: questions onperceived benefits of utilising delivery services in PHCs.

Focused group discussion (FGD): At the preliminary stage of the study, FGD conducted by the researcher was used in order to evaluate the outcome of reminder calls and home visits onANC adherence and utilisation of delivery services, also to develop the intervention programme and questionnaire. It consist of 12 questions that guided the discussion.Sixsessions of the FGD was held within a period of three weeks. Pregnant women using the intervention PHCs with the same characteristic were purposively selected for FGD.The sample consist of sixty (60)participants, ten pregnant women from each of the six intervention PHCs. The ten (10) participants for FGD in each of the intervention PHCs in Lagos State were notused for the main study.

3.8Validity of instrument: In view of the fact that the instruments were administered to heterogeneous group of illiterate/literate women, translation of the instrumentsinto Yoruba which is the main language ofindividuals in the area of study was done. The translation wasdone by a

research expert and Yoruba translator from the University of Lagos. It was back translated to English.After reconciling areas of differences; the two versions (English and Yoruba) were pilot tested with a group of pregnant women at Ijedeand Igbolomo PHCs in Ikorodu. The pregnant women weresimilar to the study population but were not used for the study. The result was used to modify the questionnaire before the final study.

3.9 Reliability: Test- retest method was used to ensure reliability in the study. The English version of the questionnaire was administered to 10 pregnant women in Agbowa PHC, after which the Yoruba version was administered and a repeat of the English version within 20 minutes interval between the tests. The three responses were analysed. The responses of each pregnant woman was matched and the responses were found to be congruent. The comparison of the three test measures the coefficient of stabilityr = 0.7603.Cronbach's alpha (α)was also used to ensure internal consistency.

3.10 Ethical consideration: An application letter, stating the nature of the study was presented toHealth Research Ethics Committee of Lagos University Teaching Hospital (LUTH), Primary Health Care Board Yaba, Medical Officer of Health and Chief Nursing Officer in charge of the local government areas in the selected administrative divisions. The proposal was presented to LUTH Health Research Ethics Committee, andan approval to collect datawas obtained. Permissionwas obtained from the participants before this study. Two consent forms accompanied each questionnaire. The pregnant women were given one of the consent forms while the researcher kept one. Participants were told they can withdraw from the study at any stage of the study if they wish. They were reassured that such withdrawal or non-participation will not cause prejudice.

3.11Procedure for data collection: The PHCs were divided into two. SixPHCs served as intervention group, and the other sixserved as control group.Twelve trained research assistants who were midwives in the PHCs and can speak Yoruba language assisted in collecting data. For 1 week the researchassistants received trainingon how to recruit and administer the research instruments in an ethically accepted manner.Recruitment of participants took place for a period of six weeks utilising the basic ANC clinic days. The list of recruited pregnant women

werecarefully compiled and assigned a numerical identity.Self-administered questionnaire was administered to the respondents in both groups which served as pretest. The pre-intervention data was collected at each PHC's ANC clinic under the close observation of the research assistants to prevent participants from exchanging ideas.This was done at the study PHCs for a period of four weeks. The questionnaire were given to the literate respondents to fill, the illiterate ones were assisted in filling their questionnaire (Reading out and explainingthe questions by the researcher or assistants).

During pre-intervention, the intervention groups were informedabout the educational programme, reminder calls and home visits. Modules on adherence to ANC and utilisation of delivery services, which include information on identification of complications during pregnancy were used as intervention measure for the intervention group during ANC at the PHCs by the researcher for 30 minutes. Adequate adherence to ANC was measured, when the participants had fulfilled the following criteria, used as a checklist:

1. Registrated forANC, at first trimester
2. Vaccination with TT vaccine
3. Received intermittent preventive treatment for malaria at ANC
4. Consumption of antihelminthics at ANC
5. Record of ANC attendance

Participant's utilisation of delivery services in the PHCswas measuredif theyhave satisfied the criteria post intervention;

1. Delived at PHCs

After deliverypost-test questions were given to both intervention and control groups.

Description of programme design

The intervention was divided into phases for convenience as stated below:

Planning phase: Sensitisation visits to the study setting, the local governmentarea (LGA), primary health centres and local health authority (2weeks). The researcher made contacts with authorities through visiting, telephone conversations and letters of briefing about the programme and application for permission to conduct the study was submitted.

Assessment phase: Consists of initial briefing and baseline assessment of all participants that agreed to take part in the study.Pre-intervention data wasanalyzed and the educational programme was packaged based on the findings. Two weeks before the scheduled intervention, all potential participants were sent a reminder by phone, inviting them to attend the ANC lecture on outcome of reminder calls and home visits on ANC adherence,the importance of delivery at the PHC and identification of complication during pregnancy.

Intervention phase: Healtheducation of the pregnant women was implemented every forth nightlyat the PHCs using the three phases of pregnancy, (First, second, and third trimester). Each participant was exposed to four (4) educational sessions, one in the first and second trimester respectively and two (2) during the third trimester for 30 minutes. Each session conducted by the researcher and the assistantsconsisted of lectures, discussions, demonstrations, sharing of information handbills and pamphlets.Participants that were absent were calledto find out why they did not attend ANC. Theywere visited at home if they did not attend the next ANCat the PHCs.During the visit it was discovered the majority of the women visited live with their mother or sister in-laws, also some have TBAs as their neighbours. The educational intervention was specifically prepared for the participants in the intervention groups and werecarried out at the ANC clinics in the PHCs. Post evaluation was conducted after delivery by the researcher and assistants.

Evaluation phase: The outcome evaluation was conducted after delivery. Also, the participants in the control group were educated after delivery using the modules on adherence on ANC and utilisation of delivery services, identification of indications of complications during pregnancyby the researcher and assistants.

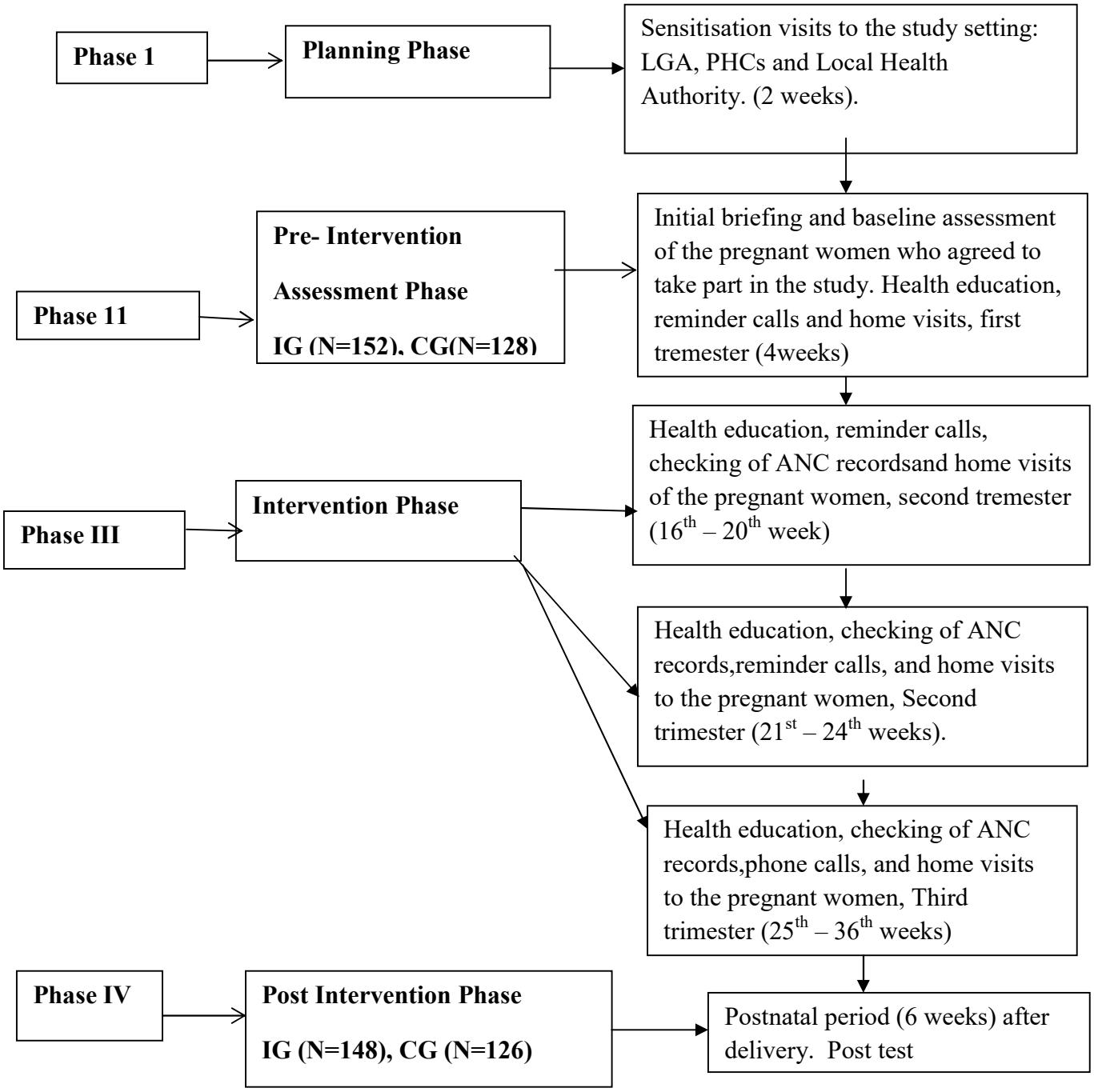

Figure 3.2The Phases of Intervention Process and Activities Involved

TheEducationalProgramme;

It was made up of four teaching sessions (modules). In developing the details of the modules, the ANC model outlined in WHO clinical guidelineswas used and other reviewed literatures on ANC.

Module 1: Benefits of adherening to ANC and utilisation of delivery services in PHCs,changes in first trimester and activities at ANC.

Module 2: Benefits of adherening toANC and utilisation of delivery services in PHCs,changes in second trimester, causes of complications in pregnancy and risk factors.

Module 3: Benefits of adherening toANC and utilisation of delivery services in PHCs,changes in third trimester, identification of complications of pregnancy.

Module 4: Benefits of adherening to ANC and delivery services in PHCs,changes during labour, postpartum, family planning methods available and baby's immunisation.

3.12: Data analysisProcedures

Data collected at the pre and post intervention periodsfrom the respondents were found suitable for analysis. In order to find out the effect of the intervention,pre and post-test data were compared. Pre-test data were collected byJune and July 2015, intervention periods were between August 2015 and Febuary 2016, while the post intervention data were collected between Febuary and March 2016 (4 weeks).The questionnaire copies were checked for completion and for errors daily. Completed questionnaire copies were coded and analysed using Statistical Package for Social Science (SPSS) version 18 software. Chi squarestatistics was used for categorical data while mean and standard deviations were used to summarizecontinuous variables, t-test was used to test relationships between and within groups.The socio-demographic distribution of participants were presented in chartsand tables comprising frequency and percentage.

Objective 1: Maternity careknowledge among pregnant women inpre and post intervention was assessed using:Section B1, questions 12 to 21 and section B2, 22 to 27.Also, for the multiple choice questions, the total score is 10, the correct answer is coded 1 while the wrong answer is coded 0. Knowledge score was converted to percentages. The participant knowledge score is categorised into Good (60% - 100%) and Poor (0% - 59%).

Objective 2: To identify the pregnant women's perceived benefits of adherence to ANC and utilisation of delivery service inpre and post intervention. Section D1 and D2 questions 38a/b - 47a/b and 48 – 52 were used to identify the respondents' perceived benefits of adherence to ANC after the intervention.

Objective 3: To assess the pregnant women's perceived barriers of adherence to ANC and utilising of delivery services inpre and post intervention. Section E, questions 53-58 and section F, questions 59-65 were used to assess the respondents' perceived barriers of adherence to ANC and utilisation of delivery services respectively after intervention.

Objective 4: To examine the pregnant women'sadherence to ANCat 16^{th} week and post-test.Section C1, questions 28 -34 wereused to examine pregnant women's level of adherence to ANC after the intervention.The correct answer is coded 1 while the wrong answer is coded 0. Adherence score were converted to percentages. The participant level of adherencescore is categorised into high (60% - 100%) and low (0% - 59%).

Objective 5: To examine the pregnant women'sintention to deliver at PHC baseline and utilisation of delivery services in intervention and control PHCs in Lagos State post intervention.Section C2 questions 35 and 37were used to examine the pregnant women inlGand CG.

Hypothesis one: There is no statistical significant difference between knowledge and adherence to ANC among the pregnant women pre and post intervention.To assess the knowledge of participants, their adherence to ANC at pre and post interventionquestions 12-21 and 28-34 were used. The pregnant women's knowledge was categorised into two:poor knowledge (0% – 59%) and good knowledge (60% – 100%). Also, their adherence to ANC was categorized into two: low adherence(0 -59%) and high adherence (60-100%).The relationship of knowledge and adherence to ANC among the IG and CGwas analyzed with chi-square at a significant level of $p = 0.05$.

Hypothesis two: There is no statistical significantdifference in the educational intervention and the participantknowledge of delivery services at baseline and post-test.Questions 22-27 were used to comparethe knowledge of participants regarding delivery services at baseline and post-test. The pregnant women's knowledge of delivery services was categorized into poor knowledge (0% -59%) and good knowledge (60% -100%). The relationship on knowledge was analyze with independent t-test at a significant level of $p = 0.05$.

Hypothesis three: There is no statistical significant difference in the perceived benefits of adherence to ANC and utilisation of delivery services between the pregnant women pre and post-intervention. Questions 53-58 and 35-36 were used to determine the pregnant women's perceived benefit on adherence to ANC and utilisation of delivery services at pre and post-intervention. Chi-squarewas used to analysedthe intervention relationship and was tested for significance at $p = 0.05$.

Hypothesis four: There is no statistical significant association between the educational intervention with the pregnant women's adherence to ANC at 16^{th} week and post-test.Questions 28 – 34 were used to examine the pregnant women's adherence to ANC at 16^{th} week and post-test. The respondents' adherence to ANC was categorised into low adherence (0 – 59%) and high adherence (60 -100%).The intervention relationship on utilisation of ANC among the groups was determined by means ofindependent t-test at a significant level of $p = 0.05$.

Hypothesis five: There is no statistical significant association between the educational intervention and the pregnant women utilisation of delivery services at baseline and post-test.Questions 35-36were used to assess the intension to utilise delivery services and the utilisation of delivery services at pre and post-test.The intervention relationship on utilisation of delivery services among the groups was tested for significance at $p = 0.05$ using chi-square statistics.

CHAPTER FOUR

4.0 RESULTS

4.1 Sociodemographic information of the pregnant women

Table 4.1a shows that majority of the participants in the IG,105(70.9%) and CG,102(79.7%) were within 20 to 29 years old. However 147(98.0%) in the IG and 119(93.0%) of the CG were married. Also123(80.3%) in the IG and 94(74.0%) of the CG were from the South west. Sixty six (43.9%) of the intervention group and 65(50.8%) of the control groups were business women. Meanwhile 68(45.3%) of the IG and 65(50.8%) of the CG had secondary education. Overall mean for age = 26.48±4.35.

Table 4.1a:Sociodemographic Characteristics of Pregnant women in IG and CG

Variable	IG (N = 152)	CG (N = 128)		χ^2	P-value
Age					
20 below	12(8.1)	14(10.9)		7.161	0.028
20 -29	105(70.9)	102(79.7)			
31 above	35(21.0)	12(9.4)			
Mean/SD for Age	**26.90±4.39**	**25.99±4.28**	**26.48±4.35**		
Marital Status					
Married	147(98.0)	119(93.0)		5.138	0.273
Single	3(1.4)	4(3.1)			
Separated	2(0.6)	4(3.1)			
Divorced	0(0.0)	1(0.8)			
Geo-political region					
South-East	10(6.8)	10(7.9)		4.598	0.331
South-west	123(80.3)	94(74.0)			
South-south	9(6.1)	9(6.3)			
North	10(6.8)	12(9.4)			
Foreigner	0(0.0)	3(2.4)			
Respondent Occupation					
Professional	6(3.4)	8(6.2)		10.096	0.018
Civil servant	32(20.9)	10(7.8)			
Business	66(43.9)	65(50.8)			
Unemployed	48(31.8)	45(35.2)			
Highest Educational Level					
Primary	39(26.2)	35(27.2)		1.723	0.632
Secondary	68(45.0)	65(50.8)			
Tertiary	35(22.0)	21(16.4)			
No education	10(6.8)	7(5.6)			

Table 4.1b shows that 73.0% of IG and 77.3% of the CG husbands were business men. However, 54.7% of IG and 55.5% of CG had secondary education. Also 74.3% of IC and 70.3% of the CG were multipara. Likewise, 50.7% of the IC and 65.6% of the CG were Christian. Meanwhile,58.6% of the IG and 60.0% of the CG monthly income was 10,000 – 29,999. Mean income (SD) for experimental = 23857±14921 and for control = 20308±12393.

Table 4.1b: Socoidemographic Characteristics of Pregnant women in IG and CG

Variables	IG (N = 152)	CG (N = 128)	χ^2	**P-value**
Husband Occupation				
Professional	11(6.1)	7(5.5)	3.483	0.323
Civil servant	29(18.9)	16(12.5)		
Business	108(73.0)	99(77.3)		
Unemployed	4(2.0)	6(4.7)		
Husband Educational Level				
Primary	23(14.9)	24(18.8)	1.159	0.763
Secondary	81(54.7)	71(55.5)		
Tertiary	44(28.4)	31(24.2)		
No education	4(2.0)	2(1.6)		
Parity				
Null para	39(25.7)	38(29.7)	0.554	0.457
Multipara	113(74.3)	90(70.3)		
Religion				
Islam	73(48.0)	43(33.6)	9.746	0.073
Christian	75(50.7)	84(65.6)		
Indigenous	2(0.7)	1(0.8)		
Others	2(0.7)	0(0.0)		
Monthly Income				
<10,000	16(10.0)	30(23.3)	12.888	0.005
10,000 -29,999	89(58.6)	75(60.0)		
30,000- 49,999	35(24.3)	16(12.5)		
50,000 and above	12(7.1)	7(4.2)		
***Mean Income(SD)**	**23,857±14921)**	**20,308±12393)**		

4.2 Research Objectives

Objective 1; Assessknowledge of maternity care among participant in intervention and control PHCs in Lagos State at baseline and post intervention.

Knowledge of ANC among pregnant women in IG and CG.

Table 4.2a,shows that majority of IG, 52.0% and CG, 60.2% at baseline were able to identify that ANC is care given to pregnant mothers. At post intervention, the proportion of respondents that identified ANC as care given to the pregnant women increased in IG, 93.4% and CG, 68.8%. However, at baseline, some of the IG, 45.6% and CG, 49.2% in the pre-test, were able to identify the booking time of ANC as 1-3 month. At post intervention IG, 81.4% and CG, 70.7% identified the booking time correctly.

At baseline, few of the IG, 17.8% and CG, 16.0% of the pregnant women identified that a normal pregnant woman should visit ANC four times and above. At post intervention it was increased to IG, 80.7% and CG, 31.9%. At baseline some of the IG, 63.3% and CG, 63.5% indicated that high risk pregnant women should visit the ANC anytime there is problem. At post intervention it increased in IG, to 85.7% and CG, decreased to 57.8%.

Table 4.2a: Pregnant women's responses on knowledge of ANC in PHCs

	Baseline		Post-test	
Variables	**IG % N= 152**	**CG % N=128**	**IG % N=148**	**CG % N=126**
Antenatal care is				
Care given to mothers	72(47.3)	50(39.1)	7(5.1)	20(16.4)
Care given to children	1(0.7)	1(0.8)	2(1.5)	17(14.8)
*Care given to pregnant mothers	79(52.0)	77(60.1)	139(93.4)	89(68.8)
Booking at ANC should start at				
*1-3months	69(45.6)	64(49.2)	110(81.4)	80(70.7)
4-6months	74(48.3)	41(32.5)	26(18.6)	28(24.1)
7-9months	9(6.1)	23(18.3)	0(0.0)	6(5.2)
Healthy pregnant women visits ANC				
Once	0(0.0)	1(0.8)	-	-
Two times	7(4.8)	2(1.6)	-	-
Three times	29(17.8)	3(2.4)	2(1.4)	2(1.7)
*Four & above	29(17.8)	23(16.0)	121(80.7)	47(31.9)
Five & above	87(59.6)	99(79.2)	25(17.9)	77(66.4)
Sick pregnant women visit				
When she wants	27(16.3)	37(29.4)	16(7.1)	41(35.3)
On appointment days	31(20.4)	9(7.1)	16(7.1)	8(6.9)
*Anytime there is problem	94(63.3)	82(63.5)	116(85.7)	77(57.8)

*** correct**

Table 4.2b shows the pregnant women's knowledge of ANC. At baseline, only 66.0% of the IG and 57.9% in CG identified that the information given at ANC is called health education. At post test it increased to 92.1% for IG and 62.8% for CG.Meanwhile, at baseline, only 30.4% of the IG and 30.4% of the CG identified that ANC at PHCs are conducted by midwives. At post test it increased to 98.6% of the IG and 80.9% of the CG.

At baseline, 100.0% of the IG and 99.2% of the CG identified that ANC played an important part inthe reduction of maternal and neonatal morbidity and mortality. Also at post test 100.0% of IG and 99.1% of the CG identified that ANC helps to reduce maternal and neonatal morbidity and mortality.

However, 27.0% of the IG and 46.0 of the CG identified that infant welfare is not one of the services given at ANC. At post test, it increased to 86.4% of the IG and 56.0% of the CG who know that infant welfare is not one of the services given at ANC.

Table 4.2b Pregnant women's responses on knowledge of ANC in PHCs

Pre-test	**Post-test**			
Variables	IG N = 152	CG N = 128	IG N = 148	CG N = 126
Information given at ANC				
*Health Education	102(66.0)	73(57.9)	137(92.1)	84(62.8)
Infant Education	45(30.6)	49(38.9)	11(7.9)	40(35.4)
Adult Education	5(3.4)	6(3.2)	0(0.0)	2(1.8)
ANC is conducted by				
Staff nurses	34(22.3)	35(28.0)	0(0.0)	2(1.7)
Community health extension workers	0(0.0)	1(0.8)	-	-
*Midwives	47(30.4)	38(30.4)	146(98.6)	99(80.9)
All of the above	71(47.3)	54(40.8)	2(1.4)	27(17.4)
ANC decrease maternal and neonatal morbidity and mortality				
*Yes	152(100.0)	127(99.2)	148(100.0)	125(99.1)
No	0(0.0)	1(0.8)	0(0.0)	1(0.9)
Services not given at ANC				
Identification of pre-existing health conditions	61(39.9)	32(24.6)	19(12.1)	30(24.1)
Early detection of complications arising during pregnancy	13(8.8)	5(4.0)	1(0.7)	10(6.9)
Health promotion and disease prevention	26(17.6)	29(22.2)	0(0.0)	14(10.3)
Birth preparedness and complication planning	10(6.8)	4(3.2)	1(0.7)	3(2.6)
*Infant welfare	42(27.0)	58(46.0)	127(86.4)	69(56.0)

***correct**

Table 4.2.1: The multiple choice questionstotal score was 10, the correct answers were coded 1 while the wrong answers were coded 0. Knowledge score was converted to percentages. The participant knowledge score were categorised into Good (60% - 100%) and Poor (0% - 59%). The table showed that the respondents had poor knowledge of ANC pre-test both in the IG and CG with p = 0.29.Also there is a significant difference in the knowledge of ANC among the IG and CG post-intervention with p = 0.00

Table 4.2.1Overall Knowledge of ANC in PHCs

Baseline					**Post Intervention**			
Knowledge of ANC in PHCs	**IG**	**CG**	**X^2**	**P value**	**IG**	**CG**	**X^2**	**P value**
Good	60(39.5)	60(46.9)	1.12	0.29	148(100)	96(76.2)	26.18	0.00
Poor	92(60.5)	68(53.1)			0(0.0)	30(23.8)		

Comparing knowledge means of ANC within the IG and CG

Table 4.2.2shows significant difference in the compared mean on knowledge of ANC amongthe respondentsbefore and afterintervention. Meanwhile, a significant increase in the post-intervention mean compared to the baseline.

Table 4.2.2 Comparing knowledge means of ANC Within Group

	IG			CG		
Variables	Mean ±SD	t-value	p-value	Mean ±SD	t-value	p-value
Knowledge of ANC						
Pre intervention	5.26 ± 1.61	23.08	0.00	5.42±1.897.02±1.67	7.33	0.00
Post intervention	9.09 ± 1.07					

Knowledg of ANC between the groups

Table 4.2.3 shows no significant different in the knowledge of ANC amongIG and CG mean at baseline, with p = 0.43. However, a significant differencein the knowledge on ANC among the IG and CG after intervention with p = 0.00.

Table 4.2.3Knowledg of ANC between the groups

Pre-test				Post- test		
Variable	Mean ±SD	t-value	p-value	Mean ±SD	t-value	p-value
Knowledge of ANC						
IG	5.26±1.61	-.78	0.43	9.09±1.07	12.04	0.00
CG	5.42±1.89			7.02±1.67		

Knowledge of delivery services among pregnant women in IG and CG.

Table 4.2.4: shows at baseline 41.5% of the IG and 60.3% of the CG identified that the purpose of delivery services at PHCs is to ensure the safety of the mothers and babies. At post intervention there was an increase of 97.1% for IG and 78.4% for CG.At baseline, 21.8 % of IG and 34.1% of CG identified that delivery at PHCs is for women without problems in pregnancy. There was an increase at post intervention with 73.6% only for IG and 28.4% at CG.

However, at baseline 27.0% of the IG and 37.9% of the CG, identified that delivery services at PHCs are conducted by midwives. There was an increase at post intervention, 97.1% of the IG and 78.9% of the CG, identified that delivery services at PHCs are conducted by midwives.
Meanwhile, 100.0% of the IG and 97.4% of the CG post-intervention know that delivery at PHCs ensures identification of complications and its management, also 99.3% of the IG and 96.7% of the CG know that delivery at PHCs reduces maternal/infant morbidity and mortality.

Table 4.2.4: Pregnant women's responses on knowledge of delivery services in PHCs

Variables	Baseline IG N = 152	Baseline CG N = 128	Post-test IG N = 148	Post-test CG N = 126
Purpose of delivering at PHC				
To ensure the safety of mothers	20(12.9)	8(6.3)	0(0.0)	4(3.4)
To ensure the safety of baby	69(45.6)	42(33.3)	4(2.9)	25(18.1)
*To ensure the safety of mothers & baby	63(41.5)	78(60.3)	144(97.1)	97(78.4)
Delivering at PHCs are for				
Women with problems in pregnancy	119(78.2)	85(65.9)	39(26.4)	88(71.6)
*Women without problems in pregnancy	33(21.8)	43(34.1)	109(73.6)	38(28.4)
Delivery services at PHCs are conducted by				
Staff nurses	18(11.5)	21(16.9)	2(1.4)	4(3.4)
Community health extension workers	1(0.7)	1(0.8)	0(0.0)	1(0.9)
*Midwives	42(27.0)	47(37.9)	144(97.1)	96(78.9)
All of the above	91(60.8)	59(44.4)	2(1.4)	25(17.2)
Delivery at PHCs ensures identification of complications and its management				
*Yes	152(100.0)	128(100.0)	148(100.0)	123(97.6)
No	0(0.0)	-	-	3(2.4)
Delivery at the PHCs reduces maternal/infant morbidity and mortality				
*Yes	150(98.6)	125(97.4)	147(99.3)	122(96.7)
No	2(1.4)	3(2.6)	1(0.7)	4(3.3)

*** correct**

Table 4.2.5;Shows that the respondents had poor knowledge of delivery services at baseline both in the IG and CG withp = 0.28.Also,there is a significant difference in the knowledge of delivery services among the IG and CG post-test with p = 0.00

Table 4.2.5; Overall Knowledge of Delivery services in PHCs

	Baseline				**Post Intervention**			
Knowledge of delivery services in PHCs	**IG**	**CG**	**X^2**	**P value**	**IG**	**CG**	**X^2**	**P value**
Good	27(18.2)	30(23.4)	1.13	0.28	134(95.7)	78(67.2)	36.13	0.00
Poor	121(81.8)	98(76.6)			6(4.3)	38(32.8)		

Comparing knowledge means on delivery service within group

Table 4.2.6shows significant difference in the compared mean of knowledge of delivery services among the respondents pre-test and post-test. Meanwhile, there was a significant increase in the post intervention mean compared to the baseline. p = 0.00.

Table 4.2.6Comparing knowledge means on delivery service within group

	IG			**CG**		
Variables	Mean ±SD	t-value	p-value	Mean ±SD	t-value	p-value
Knowledge of delivery						
Pre intervention	1.32±1.16	22.35	0.00	1.86±1.07	9.11	0.00
Post intervention	4.17±0.92			3.12±1.18		

Knowledg of delivery services between the groups

Table 4.2.7 shows a significant difference betweenthe knowledge of delivery services of the IG and CG mean at baseline with p = 0.00 and post intervention mean with p = 0.00.

Table 4.2.7 Knowledg on delivery services between the groups

	Baseline			Post intervention		
Variable	Mean ±SD	t-value	p-value	Mean ±SD	t-value	p-value
Knowledge of delivery services						
IG	1.32±1.16	-4.01	0.00	4.17±0.92	7.99	0.00
CG	1.86±1.07			3.12±1.18		

Objective 2. To assess the pregnant women's perceived benefits on adherence to ANC and utilisation of delivery servicesat pre and post intervention.

Table 4.3.1 shows that at baseline, 94.2% of the lG and 93.8% of the CG, iditified that utilisation of ANC will make them remain healthy through pregnancy, while at post-intervention, 94.9% of the lG and 86.4% of the CG identified the same. At baseline, 90.8% of the lG and 94.6% of the CG identified that utilisation of ANC will enable them learn about nutrition, personal hygiene, immunisation, prevention of malaria, danger signs and anaemia in pregnancy, while at post intervention, 95.9% of the lG and 85.8% of the CG identified the same.

Moreover, at baseline, 88.8% of the lG and 87.0% of the CG identified that knowledge from ANC will assist them to make decisions about their pregnancy on time. At post-intervention, 93.8% of the lG and 81.9% of the CG also identified that knowledge from ANC will assist them to make decisions about their pregnancy on time. At baseline, 10.5% of the lG and 8.7% of the CG indicated that knowledge from ANC will not help them to know what to anticipate at each stage of their pregnancy, while at post intervention, 6.1% of the lG and 18.1% of the CG indicated the same.

At baseline, 7.9% of the lG and 12.1% of the CG indicated that knowledge from ANC will not help them identify signs and symptoms of complications of pregnancy early while at post intervention, 3.4% of the lG and 11.0% of the CG indicated the same. Meanwhile, at baseline, 11.2% of the lG and 12.3% of the CG identified that knowledge from ANC will not make them have their baby with a trained health provider, while at post intervention it decreased to, 4.3% of the lG and 11.2% of the CG.

Table 4.3.1: Perceived benefits on adherence to ANC among participants in the IGand CG

	BaselinePost-test			
Variables	**lG N = 152**	**CG N = 128**	**lG N = 148**	**CG N = 126**
adherence to ANC will make; You maintain healthy status in pregnancy				
Yes	134(94.2)	112(93.8)	136(94.9)	108(86.4)
No	18(5.8)	16(6.3)	12(5.1)	18(13.6)
You learn about nutrition, personal hygiene, immunisation, prevention of malaria, danger signs and Anaemia in pregnancy				
Yes	138(90.8)	114(94.6)	142(95.9)	108(85.8)
No	14(9.2)	14(5.4)	6(4.1)	18(14.2)
Early decise about your pregnancy				
Yes	135(88.8)	107(87.0)	139(93.8)	101(80.2)
No	17(11.2)	21(13.0)	9(6.2)	25(19.8)
You know what to anticipate at each stage of my pregnancy				
Yes	136(89.5)	112(91.3)	139(93.9)	103(81.9)
No	16(10.5)	16(8.7)	9(6.1)	23(18.1)
You identify signs and symptoms of complications of pregnancy early				
Yes	140(92.1)	108(87.9)	143(96.6)	112(89.0)
No	12(7.9)	20(12.1)	5(3.4)	14(11.0)
You have your baby with a trained health provider				
Yes	134(88.8)	107(87.7)	140(95.7)	112(88.8)
No	18(11.2)	21(12.3)	8(4.3)	14(11.2)

Table 4.3.2 showssignificant difference in the perceived benefit on adherence to ANC among the intervention and control groups with p = 0.00 at baseline.Also, there is a significant difference in the perceived benefit on adherence to ANC among the intervention and control groups with p = 0.00 post intervention.

Table 4.3.2 Perceived benefits on adherence to ANC among IG and CG

	Baseline				**Post Intervention**			
Perceived benefit on adherence to ANC	**IG**	**CG**	**X^2**	**P value**	**IG**	**CG**	**X^2**	**P value**
Good	123(87.9)	84(72.4)	9.78	0.00	134(90.5)	100(78.1)	8.20	0.00
Poor	17(12.1)	32(27.6)			14(9.5)	28(21.9)		

Comparing the means of perceived benefits on adherence to ANC within groups

Table 4.3.3showsno significant difference in the compared mean of perceived benefit of adherence to ANC within group pre-test and post-test among the IG and CG. Meanwhile, the post intervention mean is slightly higher when compared with the baseline.

Table 4.3.3:**Comparing the means of perceived benefits on adherence to ANC within group**

	IG			**CG**		
Variables	Mean ±SD	t-value	p-value	Mean ±SD	t-value	p-value
Pre intervention	5.59±1.04	1.66	0.09	5.09±1.68	1.30	0.19
Post intervention	5.78±0.70			5.33±1.35		

Perceived benefits on adherence to ANC between groups

Table 4.3.4: shows a significant difference between the perceived benefit on adherence to ANC in the IG and CG at pre-test with p = 0.00. Also, at post-test there is a significant difference between the perceived benefit of adherence to ANCin the IG and CG with p = 0.00.

Table 4.3.4**Perceived benefits on adherence to ANC between groups**

	Baseline			Post intervention		
Variable	Mean ±SD	t-value	p-value	Mean ±SD	t-value	p-value
Perceived benefit on adherence to ANC						
IG	5.59±1.04	3.09	0.00	5.78±0.70	3.41	0.00
CG	5.09±1.67			5.33±1.35		

Perceived benefits on utilisation of delivery services by the IG and CG in PHCs

Table 4.3.5 shows that at baseline 91.1% of the lG and 79.2% of the CG, identified that delivery at PHCs is by skilled health workers, while at post intervention, there is a slight increase to 92.1% of the lG and 93.1% of the CG. Meanwhile, 86.4% of the lG and 79.2% of the CG at baseline, and 94.3% of the lG and 94.0% of the CG at post intervention indicated that delivery at PHCs reduces maternal morbidity.

At baseline, 82.2% of the lG and 77.4% of the CG indicated that delivery at PHCs reduces maternal mortality. During post intervention, 97.1% of the lG and 87.0% of the CG also indicated that delivery at PHCs reduces maternal mortality. However, 84.3% of the lG and 76.0% of the CG at baseline, and 96.9% of the lG and 87.8% of the CG post intervention agreed that delivery at PHCs reduces infant morbidity. Meanwhile, at baseline, 85.0% of the lG and 76.0% of the CG indicated that delivery at PHCs reduces infant mortality, there is an increase at post intervention with 95.7% of the lG and 81.9% of the CG indicating the same.

Also, at baseline, 89.8% of the lG and 77.2% of the CG identified that delivery at PHCs ensures management of complications. At post intervention 96.4% of the lG and 86.9% of the CG identified that delivery at PHCs ensures management of complications. However, at baseline, 73.5% of the lG and 71.2% of the CG indicated that delivery at PHCs ensures adequate child spacing. During post-intervention, 74.8% of the lG and 75.0% of the CG indicated that delivery at PHCs ensures adequate child spacing.

Table 4.3.5: Perceived benefits on utilisation of delivery services amongparticipants in the IGand CG

	Pre test		Post-test	
Variables	**lG N = 152**	**CG N = 128**	**lG N = 148**	**CG N = 126**
Delivery at PHCs is by skilled health workers				
Strongly Agree	66(43.5)	25(19.2)	53(36.0)	40(31.9)
Agree	72(47.6)	76(60.0)	81(56.1)	75(61.2)
Disagree	14(8.8)	12(9.6)	14(7.9)	8(5.2)
Strongly Disagree	0(0.0)	2(1.6)	-	-
No Idea	0(0.0)	13(9.6)	0(0.0)	3(1.7)
Delivery at PHCs reduces maternal morbidity				
Strongly Agree	45(29.3)	26(20.0)	52(35.3)	28(20.7)
Agree	85(57.1)	76(59.2)	85(59.0)	91(73.3)
Disagree	18(11.6)	10(8.0)	11(5.8)	6(5.2)
Strongly Disagree	0(0.0)	5(4.0)	-	-
No Idea	4(2.0)	11(8.8)	0(0.0)	1(0.9)
Delivery at PHCs reduces maternal mortality				
Strongly Agree	43(28.1)	31(24.2)	45(29.5)	28(20.9)
Agree	81(54.1)	67(53.2)	98(67.6)	82(66.1)
Disagree	25(15.8)	14(10.5)	5(2.9)	15(12.2)
Strongly Disagree	2(1.4)	4(3.2)	-	-
No Idea	1(0.7)	12(8.9)	0(0.0)	1(0.9)
Delivery at PHCs reduces infant morbidity				
Strongly Agree	50(33.3)	34(26.4)	47(30.9)	32(24.3)
Agree	78(51.0)	63(49.6)	97(66.0)	77(63.5)
Disagree	22(14.3)	15(11.2)	4(2.9)	15(10.4)
Strongly Disagree	0(0.0)	4(3.2)	-	-
No Idea	2(1.4)	12(9.6)	0(0.0)	2(1.7)
Delivery at PHCs reduces infant mortality				
Strongly Agree	42(27.9)	33(25.6)	50(33.8)	34(26.7)
Agree	86(57.1)	64(50.4)	90(61.9)	69(55.2)
Disagree	19(11.6)	14(10.4)	8(4.3)	21(16.4)
Strongly Disagree	3(2.0)	4(3.2)	-	-
No Idea	2(1.4)	13(10.4)	0(0.0)	2(1.7)
Delivery at PHCs ensures management of complications				
Strongly Agree	38(24.5)	32(24.4)	44(28.8)	38(27.8)
Agree	98(65.3)	67(52.8)	99(67.6)	73(59.1)
Disagree	14(8.8)	12(8.9)	5(3.6)	15(12.2)
Strongly Disagree	0(0.0)	2(1.6)	-	-
No Idea	2(1.4)	15(12.2)	0(0.0)	1(0.9)
Delivery at PHCs ensures adequate child spacing				
Strongly Agree	42(27.9)	30(23.2)	34(23.0)	42(32.8)
Agree	69(45.6)	61(48.0)	76(51.8)	53(42.2)
Disagree	34(22.4)	18(13.6)	38(25.2)	31(25.0)
Strongly Disagree	6(3.4)	4(3.2)	-	-
No Idea	1(0.7)	15(12.0)	-	-

Table 4.3.6 shows no significant difference in the perceived benefit of utilisation of delivery service between IG and CGat baseline with p = 0.46. Also,there is a significant difference in the perceived benefit of utilisation of delivery service among IG and CG at post intervention with p = 0.01.

Table 4.3.6 Perceived benefits of utilization of delivery services among IG and CG

	Baseline				**Post Intervention**			
Perceived benefit of utilisation of delivery services	**IG**	**CG**	**X^2**	**P value**	**IG**	**CG**	**X^2**	**P value**
Good	110(74.3)	90(70.3)	0.55	0.46	125(89.3)	89(76.7)	7.29	0.01
Poor	38(25.7)	38(29.7)			15(10.7)	27(23.3)		

Comparing the means of perceived benefits on utilisation of delivery services within group

Table 4.3.7showssignificant difference in the compared mean of perceived benefit of utilisation of delivery services within the participants in theIG and CG at pre-test and post test. Also, the post-test mean increased when compared to the baseline.

Table 4.3.7 Comparing the means of perceived benefits on utilisation of delivery services within group

	IG			CG		
Variables	Mean ±SD	t-value	p-value	Mean ±SD	t-value	p-value
Pre intervention	5.92±1.78	2.65	0.01	5.34±2.61	2.62	0.01
Post intervention	6.43±1.35			6.04±1.64		

Perceived benefits on utilisation of delivery between the groups

Table 4.3.8 shows significant difference in the perceived benefit of utilisation of delivery services among IG and CG at baseline with p = 0.03. Also, a significant difference in the perceived benefit of utilisation of delivery services among intervention and control group at post intervention with p = 0.04 is identified.

Table 4.3.8 Perceived benefits on utilisation of delivery services between the groups

	Baseline			Post intervention		
Variable	Mean ±SD	t-value	p-value	Mean ±SD	t-value	p-value
Perceived benefit on utilisation of delivery						
IG	5.92±1.78	2.15	0.03	6.43±1.35	2.11	0.04
CG	5.34±2.61			6.03±1.64		

Objective 3; Identify the pregnant women's perceived barriers on adherence to ANC and utilising delivery services in intervention and control PHCs in Lagos stateat baseline and post intervention.

Table 4.4.1 at baseline shows that 56.5% of the IG and 58.6% of the CG, recognised that attitude of the health care professional is a barrier to adherence to ANC. There is a slight increase post intervention with 62.8% of the IG and 63.5% of the CG indicating the same. Meanwhile, at baseline 56.5% of the IG and 46.9% of the CG, indicated that availability of facilities/equipment is a barrier while at post intervention 52.0% of the IG and 66.7% of the CG indicated the same. However, at baseline 49.7% of the IG and 51.2% of the CG, indicated that ignorant of the existing services in ANC is a barrier while at post intervention there is an increase of 64.1% in the lG and 54.9% in the CG.

At baseline, 61.8% of the IG and 64.1% of the CG indicated that language is a barrier, while during post intervention 54.7% of the lG and 51.6% of the CG indicated that language is a barrier. At baseline, 54.7% of the lG and 64.1% of the CG, indicated that schedule of ANC is not a barrier while during post intervention 57.4% of the IG and 56.9% of the CG indicated that schedule of ANC is not a barrier. Also, at baseline, 49.3% of the lG and 31.3% of the CG indicated that cultural acceptance is a barrier. During post intervention, 44.6% of the IG and 42.9% of the CG indicated that cultural acceptance is a barrier.

However, at baseline, 58.1% of the lG and 50.0% of the CG, indicated that religious acceptance of the services rendered is a barrier. During post intervention, 63.6% of the lG and 66.1% of the CG said that religious acceptance of the services rendered is a barrier. At baseline, 60.5% of the lG and 51.6% of the CG indicated their husband's non acceptance of the care rendered at ANC is a barrier. During post intervention there is an increase of 62.9% in the lG and 70.4% in the CG.

Meanwhile, at baseline, 41.2% of the lG and 35.2% of the CG indicated that proximity of ANC is a barrier. At post intervention, 45.7% of the lG and 53.4% of the CG also indicated that proximity of ANC is a barrier. At baseline, 56.8% of the lG and 57.5 of the CG indicated that status of roads to nearest ANCis not a barrier. At post intervention, 45.0% of the lG and 43.1 of the CG also indicated that status of roads to nearest ANCis not a barrier.

However, at baseline, 36.2% of the lG and 35.9% of the CG identified that cost of transportation is a barrier. While at post intervention, 56.8% of the lG and 53.2% of the CG indicated that cost of transportation is a barrier. Meanwhile, at baseline, 71.1% of the lG and 78.1% of the CG indicated that cost of service is not a barrier. During post intervention, 60.8% of the lG and 63.5% of the CG indicated that cost of service is not a barrier. Also, 54.4% of the lG and 95.2% of the CG at baseline indicated that waiting time is a barrier. At post-intervention, 82.7% of the lG and 90.4% of the CG indicated that waiting time is a barrier.

However, 38.2% of the lG and 28.9% of the CG at baseline indicated that social support is a barrier. At post-intervention, 66.2% of the lG and 55.6% of the CG indicated that social sipport is a barrier. Also, 39.5% of the lG and 26.6% of the CG at baseline indicated that mother in-law's accepting service is a barrier. At post intervention, 29.7% of the lG and 42.1% of the CG indicated that mother in-law's accepting service is a barrier.

Table4.4.1Perceived barriers on adherence to ANC amongpregnant women in IG and CG

Variables	Baseline		Post-test	
	IG N = 152	CG N = 128	IG N = 148	CG N = 126
Health care provider attitude				
Yes	89(56.5)	75(58.6)	93(62.8)	80(63.5)
No	63(41.4)	53(41.4)	55(37.2)	46(36.5)
Facilities/equipment availability				
Yes	86(56.5)	60(46.9)	77(52.0)	84(66.7)
No	66(43.5)	68(53.1)	71(48.0)	25(33.3)
Knowledge about ANC				
Yes	75(49.7)	66(51.2)	95(64.1)	74(54.9)
No	77(50.3)	62(48.8)	53(35.9)	52(45.1)
Language barrier				
Yes	58(38.2)	46(35.9)	67(45.3)	61(48.4)
No	94(61.8)	82(64.1)	81(54.7)	65(51.6)
Schedule of ANC				
Yes	69(45.3)	46(35.9)	72(48.6)	55(43.1)
No	83(54.7)	82(64.1)	76(57.4)	71(56.9)
Cultural acceptance				
Yes	75(49.3)	40(31.3)	66(44.6)	54(42.9)
No	77(50.7)	88(68.7)	82(55.4)	72(57.1)
Religion accepting services				
Yes	88(58.1)	64(50.0)	93(63.6)	82(66.1)
No	64(41.9)	64(50.0)	55(36.4)	44(33.9)
Husband'saccepting services				
Yes	92(60.5)	66(51.6)	92(62.9)	82(70.4)
No	60(39.5)	62(48.4)	56(37.1)	44(29.6)
Proximity of ANC				
Yes	61(41.2)	45(35.2)	68(45.7)	67(53.4)
No	91(58.8)	83(64.8)	80(54.3)	59(46.6)
Status of roads to nearest ANC				
Yes	66(43.2)	54(42.5)	81(55.0)	71(56.9)
No	86(56.8)	74(57.5)	67(45.0)	55(43.1)
Cost of transportation				
Yes	55(36.2)	46(35.9)	84(56.8)	67(53.2)
No	97(63.8)	82(64.1)	64(43.2)	59(46.8)
Cost of service				
Yes	44(28.9)	28(21.9)	58(39.2)	46(36.5)
No	108(71.1)	100(78.1)	90(60.8)	80(63.5)
Waiting time for ANC service (minutes)				
>=30	69(45.6)	7(4.8)	28(17.3)	16(9.6)
<30	83(54.4)	121(95.2)	120(82.7)	110(90.4)
Social support				
Yes	58(38.2)	37(28.9)	98(66.2)	70(55.6)
No	94(61.8)	91(71.1)	50(33.8)	56(44.4)
Mother in law's accepting services				
Yes	60(39.5)	34(26.6)	44(29.7)	53(42.1)
No	92(60.5)	94(73.4)	104(70.3)	73(57.9)

Table 4.4.2 shows no significant difference in the perceived barriers on adherence to ANC among the IG and CG at baselinewith p = 0.18.However, there is no significant difference in the perceived barriers on adherence to ANC among the intervention and control groups after intervention with p = 0.22.

Table 4.4.2 Perceived barriers on adherence to ANC among the IG and CG at baseline

	Baseline				**Post Intervention**			
Perceived barriers on adherence to ANC	**IG**	**CG**	**X^2**	**P value**	**IG**	**CG**	**X^2**	**P value**
Good	69(46.6)	70(54.7)	1.79	0.18	72(47.4)	70(54.7)	1.49	0.22
Poor	79(53.4)	58(45.3)			80(52.6)	58(45.3)		

Comparing the means of perceived barriers on adherence to ANC within groups

Table 4.4.3showsno significant difference in theperceived barrier on adherence to ANC among the participants at pre-test and post-test among the IG and CG. Meanwhile, the post intervention mean decreased when compared to the baseline.

Table 4.4.3 Comparing the means of perceived barriers on adherence to ANC within groups

	IG			**CG**		
Variables	Mean ±SD	t-value	p-value	Mean ±SD	t-value	p-value
Perceived barrier on adherence to ANC						
Pre intervention	7.78±3.85	0.08	0.94	7.32±3.34	0.00	1.00
Post intervention	7.74±3.82			7.32±3.34		

Perceived barriers on adherence to ANC between groups

Table 4.4.4 shows no significant difference between the IG and CG perceived barrier on adherence to ANCat pre-test with p = 0.29. Also,there is no significant difference between the intervention and control groupsperceived barrier on adherence to ANCafter intervention with p = 0.33.

Table 4.4.4 Perceived barriers on adherence to ANC between groups

	Baseline			Post intervention		
Variable	Mean ±SD	t-value	p-value	Mean ±SD	t-value	p-value
Perceived barrier on adherence to ANC						
IG	7.78±3.85	1.04	0.29	7.74±3.82	0.97	0.33
CG	7.32±3.34			7.32±3.34		

Perceived barriers on utilising delivery services between IG and CG

Table 4.4.5, shows that at baseline 56.5% of the lG and 57.0% of the CG, indicated that approach of the health care provider is a barrier, while at post intervention, it increased to 62.1% of the lG and 68.7% of the CG. Meanwhile, at baseline, 55.8% of the lG and 46.1% of the CG indicated that availability of facilities/equipment is a barrier while at post intervention it increased to 53.6% of the lG and 65.5% of the CG.

However, at baseline, 60.5% of the lG and 51.6% of the CG indicated that their husband's non acceptance of the delivery care given is a barrier while at post intervention, it increased to 62.9% of the lG and 70.4% of the CG. Also, at baseline, 64.9% of the lG and 67.2% of the CG indicated that language is not a barrier, while at post intervention, it decreased to 56.4% of the lG and 53.0% of the CG. At baseline, 34.2% of the lG and 34.6% of the CG indicated that cost of transportation is a barrier, while at post intervention, it increased to 58.3% of the lG and 53.9% of the CG.

I addition at baseline, 74.1% of the lG and 80.3% of the CG indicated that cost of service is not a barrier, while at post intervention, it decreased to 62.7% of the lG and 66.4% of the CG. Meanwhile, at baseline 48.6% of the lG and 29.7% of the CG indicated that cultural acceptance is a barrier while at post intervention, 42.9% of the lG and 43.9% of the CG also indicated that cultural acceptance is a barrier. At baseline, 58.1% of the lG and 50.0% of the CG indicated that religious acceptance of the services rendered is a barrier, while at post intervention, 63.6% of the experimental and 66.1% of the CG indicated that religious acceptance of the services rendered is a barrier.

At baseline, 36.3% of the lG and 29.6% of the CG indicated that social support is a barrier, while at post intervention, 64.2% of the IG and 54.5% of the CG indicated that social support is a barrier. However, at baseline, 38.1% of the lG and 27.6% of the CG indicated thatmother in-law's accepting services rendered is a barrier, while at post intervention, 24.4% of the experimental and 39.5% of the CG indicated thatmother in-law's accepting services rendered is a barrier.

Table 4.4.5: Perceived barriers on utilisation of delivery careamongpregnant women in IG and CG

Variables	Pre-test			Post-test		
	lG N = 152	CG N = 128	Total	lG N = 148	CG N = 126	Total
Health care provider attitude						
Yes	86(56.5)	73(57.0)	159	91(62.1)	85(68.7)	176
No	66(43.5)	55(43.0)	121	57(37.9)	41(31.3)	98
Facilities/equipment availability						
Yes	85(55.8)	59(46.1)	144	79(53.6)	81(65.5)	160
No	67(44.2)	69(53.9)	136	69(46.4)	45(34.5)	114
Husband's accepting services						
Yes	92(60.5)	66(51.6)	158	92(62.9)	87(70.4)	179
No	60(39.5)	62(48.4)	122	56(37.1)	39(29.6)	95
Language barrier						
Yes	54(35.1)	42(32.8)	96	65(43.6)	59(47.0)	124
No	98(64.9)	86(67.2)	184	83(56.4)	67(53.0)	150
Cost of transportation						
Yes	53(34.2)	44(34.6)	97	86(58.3)	68(53.9)	154
No	99(65.8)	84(65.4)	183	62(41.7)	58(46.1)	120
Cost of service						
Yes	40(25.9)	25(19.7)	65	56(37.4)	44(33.6)	100
No	112(74.1)	103(80.3)	215	92(62.7)	82(66.4)	174
Cultural acceptance						
Yes	74(48.6)	38(29.7)	112	64(42.9)	56(43.9)	120
No	78(51.4)	90(70.3)	168	84(57.1)	70(56.1)	154
Religion accepting services						
Yes	88(58.1)	64(50.0)	150	93(63.6)	82(66.1)	175
No	64(41.9)	64(50.0)	126	55(36.4)	44(33.9)	99
Social support						
Yes	56(36.3)	38(29.6)	94	94(64.2)	68(54.5)	162
No	96(63.7)	90(70.4)	186	54(35.8)	58(45.5)	112
Mother in law's accepting services rendered						
Yes	58(38.1)	35(27.6)	93	40(24.4)	51(39.5)	91
No	94(61.9)	93(72.4)	187	108(74.6)	75(60.5)	183

Comparing the means of perceived barriers on utilisation of delivery services within group

Table 4.4.6showssignificant difference in the compared mean of perceived barrier on utilisation of delivery services among the respondents pre-test and post-test in the IG and CG. Meanwhile, the post intervention mean is significantly higher when compared to the baseline.

Table 4.4.6 Comparing the means of perceived barriers on utilisation of delivery services within group

	IG			CG		
Variables	Mean ±SD	t-value	p-value	Mean ±SD	t-value	p-value
Perceived barrier on utilisation of delivery						
Pre intervention	4.53±2.64	-3.09	0.02	3.77±2.25	-6.55	0.00
Post intervention	5.43±2.23			5.60±2.56		

Perceived barriers on utilisation of delivery between groups

Table 4.4.7shows significant difference among the IG and CG perceived barrier on utilisation of delivery services at baseline with p = 0.02. Meanwhile,there is no significant difference between the IG and CG perceived barrier on utilisation of delivery services after intervention with p =0.54.

Table 4.4.7Perceived barriers on utilisation of delivery between groups

	Baseline			Post intervention		
Variable	Mean ±SD	t-value	p-value	Mean ±SD	t-value	p-value
Perceived barrier on utilisation of delivery						
IG	4.53±2.64	2.41	0.02	5.43±2.23	.614	0.54
CG	3.77±2.25			5.60±2.56		

Objective 4: To examine the pregnant women's adherence to ANC in intervention and control PHCs in Lagos stateat 16th week and post intervention.

Table 4.5.1 shows the distribution of adherence to ANC provided by health personnel at the PHCs by the participants. At 16th week, 44.6% of the IG and 58.6% of the CG did not forget to attend ANC after booking. The adherence increased during post intervenetion to 65.7% of the lG and 64.0% of the CG.

At 16th week, 37.2% of the IG and 50.7% of the CG attended ANC any time they have an appointment, while at post intervention, it increased to 77.8% in the IG and 68.2% inthe CG. However, at 16th week, 47.0 % of the IG and 70.3% of the CG did not have difficulty remembering to attend ANC, while at post intervention, it changed to 86.3% of the IG and 74.6% of the CG. At 16th week, 31.1% of the IG and 68.8% of the CG, attended ANC in the PHC only, it increased to 82.1% within the IG and 74.1% in the CG post intervention.

At 16th week, 47.3% of the IG and 67.2% of the CG, received tetanus toxoid injection at ANC, while at post intervention it increased to 81.7% in the IG and 71.4% in the CG. However, at baseline 35.0% of the IG and 67.2% of the CG, received prophylaxis for malaria at ANC, while at post intervention it increased to 89.2% in the IG and 70.6% in the CG. At 16th week, 51.4% of the IG and 57.0% of the CG received drugs for intestinal parasite at ANC, while at post intervention, it increased to 89.3% in the IG and 63.5% in the CG. High adherence to ANC was measured by checking the pregnant women record for more than four attendances, taking of complete doses of tetanus toxoid, anti-malaria and intestinal parasite drugs.

Table4.5.1: Pregnant Women Adherence on ANC at PHCs

	Baseline		**Post test**	
Variables	IG N = 152	CG N = 128	IG N = 148	CG N = 126
Do you forget to attend ANCafter booking				
Yes	84(55.4)	53(41.4)	50(34.6)	45(36.0)
*No	68(44.6)	75(58.6)	98(65.7)	81(64.0)
Do you attend ANC any time you have appointment				
*Yes	57(37.2)	65(50.7)	115(77.8)	86(68.2)
No	95(62.8)	63(49.3)	33(22.2)	40(31.8)
Do you have difficulty remembering to attend ANC				
Yes	82(53.0)	38(29.7)	20(13.7)	32(25.4)
*No	70(47.0)	90(70.3)	126(86.3)	94(74.6)
Do you attend ANC in the PHC only				
*Yes	48(31.1)	88(68.8)	119(82.1)	91(74.1)
No	104(68.9)	40(31.3)	29(17.9)	35(25.9)
Tetanus Toxoid received at ANC at 16^{th}, 24^{th}, 36^{th} weeks				
*Yes	71(47.3)	86(67.7)	120(81.7)	90(71.4)
No	81(52.7)	42(32.3)	28(18.2)	36(28.6)
Prophylaxis for malaria received at 16^{th}, 24^{th}, and 36^{th} week				
*Yes	38(25.0)	86(67.2)	124(89.2)	89(70.6)
No	113(75.0)	42(32.8)	15(10.7)	37(29.4)
Intestinal parasite drugs received at 16^{th},24^{th},and 36^{th} week				
*Yes	78(51.4)	73(57.0)	129(89.3)	80(63.5)
No	74(48.6)	55(43.0)	19(10.7)	46(36.5)

*** correct**

Table 4.5.2 shows no significant difference between the level of adherence among the IG and CG at 16th week with p = 0.19. Also, there is a significant difference between the level of adherence in IG and CG after intervention with p = 0.00.

Table 4.5.2 Level of adherence to ANC among the IG and CG at 16th week

	Baseline				**Post Intervention**			
Adherence at 16th week baseline and 36th post intervention	**IG**	**CG**	**X^2**	**P value**	**IG**	**CG**	**X^2**	**P value**
High	39(26.4)	43(33.6)	1.72	0.19	121(79.6)	53(41.4)	43.09	0.00
Low	113(73.6)	85(66.4)			27(20.4)	75(58.6)		

Comparing the means on adherence to ANC

Table 4.5.3Thereis a significant difference in the compared mean of adherence toANC among the IG with, P = 0.00. Whilethere is no significant difference in the comparaed mean of adherence to ANC among theCG with P =0. 34.

Table 4.5.3Comparing the means on adherence to ANC

	IG			CG		
Variables	Mean ±SD	t-value	p-value	Mean ±SD	t-value	p-value
Adherence to ANC						
Pre intervention	3.66±1.16	12.71	0. 00	3.98±1.26	0.96	0.34
Post intervention	5.36±1.12			4.13±1.39		

Adherence on ANC between the IG and CG

Table 4.5.4 showsa significant difference between the adherence to ANC mean of IG and CG at 16th week with p = 0.04. Meanwhile, a significant difference between the adherence to ANC mean of intervention and control groups at post testexist with p = 0.00.

Table 4.5.4Adherence on ANC between the groups

	16th week			post intervention		
Variable	Mean ±SD	t-value	p-value	Mean ±SD	t-value	p-value
Adherence to ANC						
IG	3.68±1.16	-2.12	0.04	5.36±1.12	8.16	0.00
CG	3.98±1.26			4.13±1.39		

Objective 5; Examine the pregnant women's intention to utilise the deliver servers among intervention and control groups at baseline and their utilisation of delivery services at post intervention.

Table 4.6.1 shows that at baseline, 57.4% of the IG and 39.1% of the CG intended to deliver at the PHC while at post intervention 82.4% of the IG and 57.0% of the CG delivered at the PHC.

Table 4.6.1Pregnant women's intention/utilisation of delivery services provided by health personnel at the PHCs

Baseline IG= 152CG = 128 Post intervention IG=148 CG=126

Variables	Intended to delivery atPHC		Delivered at PHC			
	Yes	**No**	**Yes**	**No**	**X^2**	**pvalue**
IG	85(57.4)	67(42.6)	122(82.4)	26(17.6)	3.71	0.054
CG	50(39.1)	78(60.9)	73(57.0)	53(43.0)	0.09	0.77

4.3: Hypotheses Testing

H01: There is no significat difference between knowledge and adherence to ANC betweenthe pregnant women in lG and CG.

Table 4.7.1 shows no significant difference between knowledge and adherence to ANC among the pregnant women in lG and CGat baseline with p = 0.32 for IG andp = 0.93 for CG. Also,there is no significant difference between knowledge and adherence to ANC betweenthe pregnant women in lG and CGat post intervention with p = 0.79 for IG and 0.13 for CG.

Table 4.7.1Adherence to ANC and knowledge of ANCat Baseline

Variables			Knowledge of ANC		X^2	Pvalue
			poor	good		
IG	Adherence to ANC	High	24(61.5)	15(38.5)	0.99	0.32
		Low	61(40.1)	52(47.7)		
CG	Adherenceto ANC	High	14(32.6)	29 (67.4)	0.01	0.93
		Low	27(31.8)	58 (68.2)		

Adherence to ANC and knowledge of ANCat Post intervention

Variables			Knowledge grp		X^2	Pvalue
			Poor	Good		
IG	Adherence to ANC	High	67(55.4)	54(44.6)	0.073	0.79
		Low	18(58.1)	13(41.9)		
CG	Adherence to ANC	High	13(24.5)	40(24.5)	2.339	0.13
		Low	28(37.3)	47(62.7)		

H02: There is no significant difference between the educational intervention and the pregnant women's knowledge of delivery services among the lG and CGpre and post intervention.

Table 4.8.1 shows a significant difference between the knowledge of delivery services of the IG and CG mean at baseline with p = 0.00 and post intervention mean with p = 0.00.

Table 4.8.1 knowledge on delivery services between the participants in the IG and CG.

knowledge of delivery services in PHCs	IG	CG	t	pvalue
Pre	1.32±1.16	1.86±1.07	-4.01	0.00
Post	4.17±0.92	3.12±1.18	7.99	0.00

H03: There is no significant difference in the perceived benefit on adherence to antenatal care and delivery services utilisation between the participants in the lG and CGpre and post intervention.

Table 4.9.1 shows a significant difference in the perceived benefit of adherence to antenatal careand delivery services utilisation between the pregnant women in the IG at post intervention with p = 0. 00. There is no significant difference in the perceived benefits of adherence to antenatal careand delivery services utilisation among the pregnant women in the CG at post interventation with p = 0.22.

Table 4.9.1 Perceived benefits of adherence to ANC and utilisation of delivery services at Post intervention

Veriables			Benefit level		X^2	Pvalue
			Poor	Good		
IG	Delivered at PHC	No	6(26.1)	17(73.9)	6.79	0.00
		Yes	9(7.7)	108(92.3)		
CG	Delivered at PHC	No	14(38.9)	22(61.1)	1.505	0.22
		Yes	22(27.5)	58(72.5)		

H04: There is no significant association between the educational intervention and the pregnant women's level of adherence to ANC baseline and post intervention between the lG and CG.

Table 4.10.1 shows a significant different between the adherence to ANC mean of IG and CG at baseline with p = 0.04. Meanwhile, there is significant difference between the adherence to ANC mean of intervention and control groups at post intervention with p = 0.00.

Table 4.10.1 Level of Adherence to ANC between the Pregnant Women in the IG and CG

	At 16th week			Post intervention		
Variable	Mean ±SD	t-value	p-value	Mean ±SD	t-value	p-value
Adherence to ANC						
IG	3.68±1.16	-2.12	0.04	5.36±1.12	8.16	0.00
CG	3.98±1.26			4.13±1.39		

H05: There is no significant association between the pregnant women's intention to delivery at the PHC and their utilisation of delivery services post intervention between the lG and CG.

Table 4.11.1 shows no significant association between the pregnant women's intention to delivery at the PHC and their utilisation of delivery services post intervention between the lG and CG.

Table 4.11.1 Utilisationof Delivery ServicesamongParticipants in the IG and CG

	Baseline N = 152Post intervention N=148			
Variables	Intended to delivery at the PHC	Delivered at the PHC	X^2	pvalue
IG	85(57.4)	122(82.4)	3.71	0.05
CG	50(39.1)	73(57.0)0.09		0.77

Theeffect of the socioeconomic status of the participants on their adherence to antenatal care and utilisation of delivery servicespre and post intervention.

Table 4.12.1 shows no significant associationbetween age and ANC adherence;OR = 0.48, CI = 0.14-1.70. Except the professionals, their occupation is not significantly associated with ANC adherence and utilisation of delivery services; OR = 3.68, CI = 0.38-35.46. However the participants income has no significant association with ANC adherence and utilisation of delivery services; OR = 1.25, CI = 0.14 - 10.89.

Table 4.12.1 Participant Age, occupation and income their adherence to ANC and utilisation of delivery services

Variable	Odd ratio	P value	95% C. I	
Age (years)				
20 below*		0.44		
21-30	0.32	0.24	0.05	2.13
31 above	0.48	0.26	0.14	1.70
Occupation				
Professional*		0.03		
Civil servant	0.27	0.28	0.03	2.92
Business	3.68	0.26	0.38	35.46
Unemployed	0.32	0.03	0.11	0.91
Income				
below 10000*		0.86		
10,000-29,000	1.25	0.84	0.14	10.89
30000-49000	1.66	0.59	0.26	10.71
50,000 above	2.09	0.46	0.30	14.48

* Reference value

Table 4.13.1 shows that among the IG 94(61.8%) out of the 152 attended ANC after the first intervention with the module. Reminder calls were made to 58(38.2%) of the women. Only 16(10.5%) came to ANC after receiving the call. Forty two (27.6%) were visited at home. Mojarity of the participants visited at home live in their family houses with their mother in-law or sister in-law. They also have relatives or neighbors who are TBAs.

Table 4.13.1 Follow-up techniques used for the lG

PHCs	Number of participants	Reminder call	Home visit
Epe	20	10(50.0)	7(35.0)
Imota	28	12(42.9)	7(25.0)
Eredo	26	10(38.5)	10(38.5)
Ita-Elewa	28	10(35.7)	6(21.4)
Ipakodo	26	6(23.0)	4(15.4)
Oke Eletu	24	10(41.7)	8(33.3)
Total	152	58	42

Percentage of delivery in each lntervention PHC before the study and after the study

Table 4.14.1shows the percentage of women that deliver at Epe PHC before the study were 40% but it increased to 60% after the study. Also, the percentage of women that deliver at Eredo improved from 25% to 51%. Pregnant women that delivered at Imota increased from 35% to 50%, and at Ita-Elewa there is an increase from 45% to 65%. At Ipakodo, the percentage increased from 50% to 65%and at Oke-Eletu, the percentage increased from 35% to 55%.

Table 4.14.1 Percentage of delivery in each lnterventionPHC pre and post test.

S/NO	Name of PHC	Pre-test	Post-test
1	Epe	40.0%	60%
2	Eredo	25.0%	51%
3	Imota	35.0%	50%
4	Ita-Elewa	45.0%	65%
5	Ipakodo	50.0%	65%
6	Oke-Eletu	35.0%	55%

CHAPTER FIVE

5.0Discussion, Summary, Conclusion and Recommendation

This chapter presents result from the study onoutcome of reminder calls and home visits on antenatal care adherence and utilisation of delivery services in Primary Health Centres in Lagos State. The research took place among participant attending ANC in the selected Primary Health Centres in Epe, Ikorodu and Bardagry. Same cohort of participants were used at pre and post-intervention. At baseline, the IG were N = 152 and CG were N = 128. During follow-up, some of the respondents did not come back. At post intervention, the IG were N = 148 and CG were N= 126. Showing that 2.6% of the IG were lost to follow up, also 1.6% of the CG were lost to follow up.

5.1.1 Participant's socio-demographic variables

For women from areas with poor general health status, ANC is one of the most effective health interventions in preventing maternal morbidity and mortality.The socio-demographic result shows that all the participants in lG and majority in GC are married. Same result was found by studies conducted in this area by many authors including, Tadeseand Ali (2014); Ali, Dero, Ali and Ali (2018)and Adewoye, Musa, Atoyebiand Babatunde (2013) cited by Akpeli (2019), atNorth Central Nigeria, particularly in Ilorin-East Local Government Area, where majority of their respondents were married and 65.2%of thewomen were within child bearing age.The conceptual model applied to the study revealed the individual characteristic of the pregnant women which were age, marital staus, and parity as part of the demographic characteristic needed for the study.

Majority of the respondents were from the South West political zone.This is because the research work took place in the South West political zone of Nigeria. This is the same in another study by Adewoye, Musa, Atoyebi andBabatunde (2013),cited by Akpeli (2019)conducted in the same political zone of Nigeria. Majority of the experimental and control groups respondents, with their husbands,were business men and women, some of the women were unemployed, while only few of their husbands were unemployed.The socio-economicstatus of the respondent, according to the conceptual framework was part of the individual characteristic to be considered for the study. According to Kawungezi,AkiiBua, Aleni, Chitayi, Niwaha, et al(2015) study in upcountry areas of Ugandahas the majority of their respondents,74.24%,aspeasants.

Majority of the respondents and their husbands in the intervention and control groupshave primary and secondary school education.Alsosomeof the intervention and majority of the control respondents' monthly income was 10,000 -29,999 Nigeriannaira. This is a major factor affecting adherence to ANC and utilisation of delivery service with skilled health personnel. This is also observed byNDHS(2013) that most of the women who were unemployed and with low income could not utilise skilled delivery services.Esena and Sappor (2013) cited by Heloo (2018),in their study in East municipality of Ghana supported the findings of this current study. Also supporting the current study is aMulti-Center Study by Kawungezi, AkiiBua, Aleni, Chitayi, Niwaha, et al(2015) in Upcountry Areas of Uganda.The observation was different in a study by Olabisi,Olabisi andDairo(2015)on ANCutilisationin Nigeria.Majority of their respondents had no formal education.Education significantly increased utilisation of prenatal care in a research byOyedele, (2017) on maternal healthcare utilisation determinants in Nigeria.

Participants'husbands'occupation and level of education improved their ANC and delivery services utilisation in the study conducted by Olawale(2015).A significant percentage among the respondents in the experimentaland control groups were multigravidas.AMulti-Center Study by Kawungezi, AkiiBua, Aleni, Chitayi, Niwaha, et al(2015) in Upcountry areas of Uganda supports the finding where 84.39% of their respondents were multigravida. This is contrary to the findings by Adewoye, Musa, Atoyebi and Babatunde (2013) cited by Akpeli(2019), in their study in Ilorin-East LGA of Nigeria where majority of their respondents were premigravida.

5.1.2Knowledge of ANC and Delivery Services at PHCs Pre-test

Current study participants in intervention and control groups were not knowledgeable about ANC and delivery services at baseline in the PHCs. This increased after intervention. This could be because majority ofthe participants had secondary education and weremultiparous asobserved by Adewoye, Musa, Atoyebi and Babatunde (2013),cited by Akpeli (2019)where 69.9% of their respondents were multiparous. Also,another studyby Ojong, Idang, Uga Adaora and Chiotu, (2015)observed increased knowledge of antenatal care and delivery services in their studyin Calabar (Cross River State of Nigeria) because majority of their participants were multigravidas.

According toAkanbiemuet etal (2013) in south west Nigeria their participants hadgoodknowledgeofthepurposesandservicesof ANC.

In anothersupporting study in Ghana, Kenya and Malawi by Pell-Mail,Meñaca, Were and Afrah et al (2013),cited by Amoakoh-Coleman, Agyepong, Zuithoff, Kayode,Grobbee, Klipstein-Grobuschand Ansah (2016), their respondents had unclearknowledge of ANC.Also in a study by Mason Delicour, Ter Kuile and Ouma et al (2015)at Western Kenyaon obstacles and facilitators to ANC and birth Care at baseline, the control group was more knowledgeable than the intervention group about ANC at PHCs. This is exemplified in Adewoye, Musa, Atoyebi and Babatunde (2013), cited by Akpeli (2019), study in North Central Nigeria, ofIlorin-East Local Government Area. Majority of their participants know about ANC services,and the activities carried out there, which is related to the high literacy status of the participants.

In the study, the pregnanat women were not knowledgeable about delivery services at baseline, which increased after intervention and also increased utilisation, unlike the result from the study by Muluwas, Muluemebet and Misra (2015) in West Ethiopiawhere knowledge of delivery services was a cause of low utilisation. The intervention increased the pregnant women's knowledge of delivery services. This could be because majority of them are educated and multigravidas. This is supported byOyedele's (2017), study in Nigeria on Determinants of Maternal Healthcare Utilisation.The resultshowed a significant rise in mean on knowledge of ANC between the participants at baseline and after intervention $p = 0.00$ within the groups. Meanwhile,in the post intervention there was a significant increase with $p = 0.00$, mean compared to baselinep = 0.43, between the groups. Mean±SD for IG at post intervention 9.09±1.07, for CG at post intervention 7.02±1.67.

The compared knowledge mean on delivery services within the pregnant women revealed in both baseline and post intervention,a significant difference ofp = 0.00. Meanwhile, a significant increase in the post intervention mean compared to the baseline was noticed.Mean±SD for IG at post intervention 4.17±0.92,for CG at post intervention 3.12±1.18.Also, knowledge of delivery services between the groups was significant at baseline and after intervention with $p = 0.00$ and $p = 0.00$. The conceptual framework used for the study revealed that the reminder calls and home

visits played a major role in individual characteristic and behavioural specific cognition and effect of the participants (knowledge) and led to increase in knowledge of ANC and delivery services.

5.1.3 Knowledge of ANC and Delivery Services Post-test

Remarkable improvement was observed in theknowledge of ANC and delivery services by skilled health care givers in experimental grouppost intervention while in the CG there was a slight increase due to the routine ANC they received. This shows that the intervention had effecton the participant's knowledge of ANC and delivery services compared to results at baseline.A research work by Maputle, Lebese, Khoza, Khoza, Shilubane, Shilubane and Netshikweta (2013)cited by Catherine and Brenda (2017),and aqualitative studyby Pell, Meñaca, Were, Afrah, Chatio, Manda-Taylor, Hame, Hodgson, Tagbor, Kalilani, Ouma, Robert and Pool (2013),cited by Heloo (2018)in Ghana, Kenya and Malawiaimed to describe the factors affecting ANC attendance: showtheir respondents' descriptions of ANC as unclear, and that the findings were comparable with that of baseline.

It was noticed that the educational level of the participants was associated with their knowledgeand majority of the participants attended secondary school 68(45) in IG and 65(50.8) in CG. At pre and post-test,the IG mean had a significant change. If this knowledge acquired by the participants during the intervention is translated to practice, there will be notable reduction in morbidity and mortality caused by pregnancy and delivery.

5.1.4 Perceived Benefits of Adherence to ANC and utilisation of delivery services among the lntervention Group.

The result from the study showed that the perceived benefit of adherence to ANC increased at post intervention in both groups. It was noted in a study by Krishna, Yuba, Resham, Ravi, Rajan, Suresh and Rajendra (2015) thatdaughter-in-laws from rich families are encouraged to utilise ANC inEastern Nepal.The benefits of adhering to ANC and utilisation of delivery services in the PHCswas emphasised on the intervention part of the conceptual framework used for the study.

Also the perceived benefit of utilising delivery services among the respondents increased post intervention. This is similar to the findings by Moyer, Benyas and Rominski (2016) in East Delhi

and Jibril, Saleh, Afolayan, Morisola, Umarand Abiola (2017) in South West Nigeria where their respondents utilised skilled delivery services because of the benefits. In a similar study by Adewoye, Musa, Atoyebi and Babatunde (2013) cited byAkpeli (2019).In the Eastern part of llorin LGA, North Central Nigeria shows that utilisation of ANC and delivery care depends on knowledge of ANC.

The compared means within groups of perceived benefit of adherence to ANCshow no significant difference among the respondents at pre and post intervention. Meanwhile, the post intervention mean for IG = 5.78±0.70 was slightly higher when compared to the baseline, IG 5.59±1.04 and CG = 5.33±1.35 and 5.09±1.68. However, the compared means between groups of perceived benefit of adherence to ANCshowed significant difference among intervention and control groups before and after intervention with p = 0.00 respectively.

Comparingmeans of perceived benefits of utilisation of delivery serviceswithin groups show a significant difference among the respondent before and after intervention. Meanwhile, after intervention mean within groups IG = 6.43±1.35 increased when compared to the baseline with IG 5.92±1.78 and CG 6.04±1.64 after intervention while baseline CG = 5.34±2.61 with p = 0.01respectivetly. Also, between groups compared mean shows a significant difference at baseline p = 0.03 and post intervention p = 0.04.

5.1.5 Perceived Barriers of adherence to ANC and Delivery Service utilisation in lntervention Group

This study reveals that what the respondents at IG saw as perceived barrier were no longer barriers at post intervention. This is not the same in the CG. At baseline both groups identified their barriers which was similar with studies by Muluwas et al (2015), Singh, Kariwal, Gupta, Shrotriya and Singh (2014)and also Olawal (2015). In the conceptual framework for the study, the barriers were discussed during the intervention, solutions to each of the barriers were explained to the IG, thus the reduction in number of perceived barriers of adherence to ANC and utilisation of delivery services among the IG at post intervention. A study by Krishna, Yuba, Resham, Ravi, Rajan, Suresh and Rajendra (2015),revealed that some socio-cultural factors were seen as barriers by their respondents, also the quality of health services and belief in TBAs were

highlighted. In the current study, accessibility of health services was recognized as a barrier. Avaliability of health care serviceswas highlighted in a similar research carried out in Ethiopia, as an importnant factor to utilisation of maternal healthcare facilities in developing countries (Muluwas, Muluemebet and Misra, 2015).

Comparingmeans within groups onperceived barrier on adherence to ANCshowed no significant difference among the respondents at baseline IG with p = 0.94 and CG with p=1.00. Meanwhile, the post intervention mean decreased among the IG, while CG remains the same. Perceived barrier onadherence to ANC between intervention and control groups showed no significant difference before and after intervention. Also, compared mean among the IG and CG showed no significant defference at baseline p = 0.29 and post intervention p = 0.33.

Comparingmeans of perceived barrierwithin the groups on utilisation of delivery servicesshowed a significant difference among the participants in IG with p = 0.02 and CG with p = 0.00. Meanwhile, the compared mean between groups at baseline is IG = 4.53±2.64 and CG = 3.77±2.25, at post intervention the mean increased, IG 5.43±2.23 and CG 5.60±2.56. Perceived barrier onutilisation of delivery servicesbetween IG and CG showed a significant difference at baselinewith p = 0.02and no significant difference at post intervention with p = 0.54.

5.1.6: The pregnant womenAdherence to ANC in IG and CG

There was a change in the adherence to ANC services among the intervention group post-intervention. Most remarkable improvement was observed in the number of visit to ANC clinic during the intervention (health education,reminder calls and home visits). Therural setting where the study was conducted had PHCs as the only accessible health care facility also contributed to the increase.A study by Emelumadu, Onyeonoro, Ukegbu, Ezeama, Ifeadike and Okezie (2014) for ANC (97.0%; 95% CI, 94.4-98.4%) and natal services (92.7%; 95% CI 89.2-95.2%)showed that utilisation of facility were quite high for their participants in the selected PHC facilities in Anambra State, Southeast Nigeria which is a rural setting. Supporting literatures includes Muluwas, Muluemebet and Misra (2015) in West Ethiopia where utilisation of ANC was 78.4%. Also, utilisation of delivery services was affected in their studybecause their participants were rural residents.

Pell, Mail and Meñaca et al (2013),cited by Heloo (2018),in their study found out thatreducedcomplianceand delays inattendancewithANC arebecause ofa varietyofother coststhatwomenhavetomeetwith whileattendingANC.In another study by Krishna, Yuba, Resham, Ravi, Rajan, Sureshand Rajendra (2015), it was observed that deficient knowledge of services,and socio-cultural factors like disadvantaged ethnicity,contact with information, lower women's autonomy, and belief in traditional healers were barriers to ANC service utilisation in Sunsari district of eastern Nepal. The current studyshowed positive resultof the intervention on the experimental group. The level of education and occupation of the participants and their husbandsaffected adherence to ANC service in the study.

Comparison of adherence to ANC within groups for IG at baseline 3.66±1.16, CG 3.98±1.26 while at post intervention,there was an increase in the mean IG = 5.36±1.12 and CG = 4.13±1.39, alsosignificant difference existed in the IG, p = 0.00 and no significant in CG p = 0.34. Meanwhile, the compared mean between the groups revealed a significant difference at baseline, p = 0.04 and post intervention, p = 0.00.

5.1.7Intention to Utilise Delivery Services at Baseline and Utilisation of Delivery Service Post Intervention in the IG and CG

The respondents that utilised the delivery care services at the PHCs post intervention among the IG and CG increased in number in the present research. A study byTsegay, Gebrehiwot, Goicolea, Edin, Lemma and Sebastine (2013) revealed thatinstitutional delivery increase with education of the respondents. This is supported by Lagos State Government Ministry of Health (2017) in their report. In a similar study by Muluwas, Muluemebet and Misra (2015) in West Ethiopia it was recommended,that the importance of families discussing institutional delivery service utilization is vital. In the current study participants were visited in their homes to encourage utilisation of delivery services.

According to Esena and Sappor (2013),cited by Heloo (2018), statistical association with the utilisation of skilled deliverywas noted in their study in the following areas, household income,maternal education, occupation as well as religion. They foundsome of the challenges that caused barriers to utilisation of skilled delivery services, which include: high cost of care 27.7%, transportation difficulty 43%, high cost of transport (25.3 %).Others are, influence of

family decisions, poor attitude of health workers and poor quality care.The rest were traditional/cultural or religious reasons. However,the interventionaccording to the conceptual framework helpedin resolving the above perceived barriers and increased the number of respondent that delivered at the PHC in the current study.

5.1.8 Hypotheses(H0)

H01 There is no significant difference between knowledge and adherence to ANC betweenthe pregnant women in lG and CGpre and post intervention.

There is no significant difference between knowledge and adherence to ANC among the participant after intervention in IG with p = 0.79,and CG with p = 0.13was thestudy result. Muluwas, Muluemebet and Misra, (2015) in their study among those who attended secondary school,found out that among the literate,utilisation of ANC service was more than 7.6 times higher and morethan 3.18 times compared to those whowere illiterate respectively. However, utilisation of ANC services was 1.96 times higher among mothers who were not knowledgeable on ANC services than participants who wereknowledgeable about ANC service.Despitethelevelofgoodknowledge ofANCafter intervention foundinourstudy,wedidnotfind knowledgeasasingular factorthataffecttheutilisation ofANCfacilities, this could be because the study took place in a rural setting.

H02:There is no significant difference between the educational intervention and the pregnant women's knowledge of delivery services among the lG and CGpre and post intervention.

The result showed significant relationship between IG and CG knowledge of delivery service at pre and post intervention with p = 0.00 at pre-test and p = 0.00 at post intervention. Though the mean of the IG, 4.17±0.92 was higher than the CG 3.12±1.18. The conceptual framework showed that the intervention further improved the knowledge of participants in the intervention group.

H03:There is no significant association between the educational intervention and the pregnant women's level of adherence to ANC before and after intervention between the lG and CG.

The result showedsignificant relationship on the level of adherence to ANC between the IG and CG at 16th week, with p=0.04 and at post intervention with p = 0.00.According to a similar

study by Onamade (2014) in Northen part of Nigeria, education of respondents determines their adherence to antenatal clinic. Level of education and the type of clinic patronage was p = 0.001 in their study. Akanbiemu, Manuwa-Olumide, Fagbamigbe and Adebowale (2013), cited by Adebowale and Akinyemi(2016) found out that knowledgeofANCwasnotfoundtobeassociatedwithANCutilisation.

H04:There is no significant association between the educational intervention and the pregnant women utilisation of delivery services post intervention between the lG and CG.The findings showed a significant association in the level of utilising delivery service among the IG, p = 0.05 and no significant association among CG, p=0.77.Oyedele (2017), in a similar study, found out that educationincreases prenatal and postnatal careutilisation.The current studyresults was supported by women's empowerment on maternal health care utilisation influenceas indicated in Albania by Sado, Spaho, and Hotchkiss,(2014).

H05:There is no significant difference in the perceived benefits of adherence to ANC and delivery services utilisation between the pregnant women in the lG and CGpost intervention.

The finding showed a significantdifference in the perceived benefiton adherence to ANC and utilisation of delivery services among the IG, with p = 0.00 and also no significantdifference in the perceived benefit on adherence to ANC and utilisation of delivery services among CG at post intervention, with p= 0.22.Akanbiemu, Manuwa-Olumide, Fagbamigbe and Adebowale (2013),cited by Adebowale and Akinyemi(2016)studysupportresults of the current study.

There is no significant association on participant's socioeconomic status and their adherence to ANC and utilisation of delivery services among the lG and CGat baseline and after intervention.

The results showed no significantassociationwith ANC adherence and utilisation of delivery services with age (OR = 0.48, CI = 0.14-1.70),occupation (OR = 3.68, CI = 0.38-35.46) and income (OR = 1.25, CI = 0.14 - 10.89).In another study byAkanbiemu, Manuwa-Olumide, Fagbamigbe and Adebowale (2013),the respondents'typeofoccupation wassignificantlyinfluencedbyrespondents' knowledge thissupported the current study. Also in a study byKrishna, Yuba, Resham, Ravi, Rajan, Suresh, and Rajendra (2015), where association of

age, education of mother, and parity was not associatedwith utilisation of ANC and delivery care. According to Joshi, Torvaldsen, Hodgsonand Hayen(2014)their research looked at factors associated with use and quality of antenatal care in Nepal. Their findings is contrary to the result of the current study.

Research work by Gitonga (2017), found out that determinants of uptake of focused ANC are the participants'level of education, type of employment, household income, parity, and marital status. This is related to the result by Finlayson (2013) cited by Ali, Dero, Ali and Ali, (2018)and Singh, Kariwal, Gupta, Shrotriya and Singh (2014) in their studies.Contrarily, the study by Jibril, Saleh, Afolayan, Morisola, Umarand Abiola(2017) in South West Nigeria, revealed that socioeconomic status of the women plays a vital part as far asdelivery services utilisation is concerned. Also, in a study by Singh,Kariwal, Gupta, Shrotriya,and Singh(2014),were financial, unawareness about ANC services and cultural belief causeinadequate utilisation of ANC services.

5.2 Contribution to Knowledge

- The study has provided preliminary data on pregnant women adherence to ANC and utilisation of delivery services that was not there at baseline in Lagos state rural setting as stated in the abstract.
- Health education did a lot to improve knowledge of the participants in the study.
- Home visits assisted to motivate participants' adherence to ANC and utilisation of delivery services in the study.
- Phone calls encouraged participants' adherence to ANC in the study.

5.3. Limitations of Study

The research utilised quasi experimental design in which some variables were beyond the researcher'scontrol. Pregnant women utilising ANC in PHCs in Lagos State were used for thisstudy. Though they represent pregnant women generally as they have similar characteristics but a larger study would have been more generalisable. This study utilised twelve PHCs in the

rural part of Lagos State for control and experimental group. More primary health centers would have been involved to increase its power of generalisation.

There was political instability at the initial part of the study as it was an election year and transition period. Some of the research assistants (midwifery) were changed, when they were transferred to another PHC.Women who were already seeking ANC in primary health centres were used for this study, it might not reproduce the view of those who never sought care in health facilities.

Cultural beliefs and activities in the rural settings where the study took place also delayed the study. Despite the limitations, the study provides valuable information concerning the barriers that affect the respondent's adherence to ANC and utilisation of delivery services in PHCs.

5.4 Implications for Further Studies

- There is need to replicate this study on a larger scale to increase generalization of findings. This will help to observe if the finding in the North or Southeast or South-South will be similar to this carried out in the South West.
- This study should also be carried out using other professionals in the Parental and infant/child Health Units at the PHC level since they are very close to the grassroots. This could help them provide useful and correct information.
- Majority of the women indicated barriers that affect their adherence to antenatal care and utilization of delivery services. There is need to study how these barriers can be handled.

5.5 Implications for Nursing

Antenatal care services provided by skilled midwivesare most effective health interventions for reducing maternal morbidity and mortalityin areas where the general health status of women are poor. During ANC, a skilled Midwife carries out the following activities;health education on nutrition, birth preparedness, delivery care and family planning options after birth, also there areopportunities for identifying threats to the mother and unborn baby's health as well (Muluwas, Muluemebet and Misra, 2015).

In developing countries reminder calls, home visits, and health education by the midwife isrequired as she/he can function independently if adequately trained. Decreasing prenatal/natal morbidity and mortality could be achieved by using this approach. In addition,Muluwas, Muluemebet and Misra (2015) reported the significant recognitionof ANC services in decreasing maternal mortality and morbidity. To carrying out ANCsupervision and delivery services Muluwas, Muluemebet and Misra(2016) used trained nurses to ensure skilled health care.

Esena and Sappor (2013),cited by Heloo (2018),in their recommendation said that there is need to promote domiciliary midwifery.More registered midwives are needed in PHCs for effective implementation of this approach in ANC. The most important approach is to follow up ANC clients (home visits) to ensure adherence and skilled delivery.

TheMidwife has a major part to play since he/she is the first point of contact at ANC. Therefore,management of ANC withgooddeliverypracticesbymidwives shouldbestrengthenedtoensuresafeandhealthy deliveryfor mothersand their babies.

5.6: Recommendations

- Provision of condusive work environment at the rural PHCs for effective implementation of health education, reminder calls and home visits during ANC.
- Early identification of perceived barriers and provision of interventions during ANC.
- More emphases should be placed on the benefit of ANC and delivery with skilled birth attandent during routine ANC.

5.7: Summary and Conclusion

In Lagos State, more than half of maternal deaths occurs duringlabour and immediately after (Oye-Adeniran, Odeyemi, Gbadegesin, Akin-Adenekan, Akinsola, Ekanem and Osilaja, 2014). There should be organised community health education on the importance of having skilled midwives at child birth. Women should be advised on the importance of usingcontraceptive to avert unwanted pregnancies and unsafe abortions. Moreoverthere

should be availability, accessibility and affordabilityof emergency obstetric cares at health facilities including rural PHCs.

The research studytook place in twelve selected PHCs in Lagos Stateutilising a quasi experimental design. Intervention and control groupsPHCs were created from the twelve. Utilising systematic sampling at baseline,280 participants were selected. The IG were 152 while CG were 128. Baseline data were collected from pregnant women using the same validated structured questionnaires. Four modules were conducted for the participants in the IG at first, second, and two at the third trimester. Reminder calls and home visits wereused to track the participants that were not regular at ANC. The questionnaire was administered to the participants in IG and CGpost-intervention. Independent t- test,Chi square and multiple regression were used for data analysedat p = 0.05.

Resultsfrom the study showed a significant difference in knowledge of ANC and delivery service, level of adherence to ANC and utilisation of delivery services and perceived barrier among IG between the baseline and post intervention (p =0.05) using Chi-square test after the score has been classified. Higher numbers of pregnant women acquired good knowledge, adhere to ANC and utilise delivery facilities. The study also revealed that there were a lot of barriers which have prevented the pregnant women from effectively adhering to ANC and utilising delivery services at PHCs. An interventional study focusing on these barriers is needed, which will contribute toreduce maternal and infant death during pregnancy and delivery.

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Serial No……..

QUESTIONNAIRE

University of Ibadan,Department of Nursing

Dear participant,

I am a post graduate student in the above institution. My studyis on the outcome of reminder calls and home visits on adherence to ANC and utilisation of delivery servicesin PHCs in, Lagos State.Your honest and sincere responses to the questions/items will be highly appreciated. You

will be contributing to a study that will sever as a foundation for further studies in this special group of women. Confidentiality of information is granted.

Section A: Dataon Socio-Demography: Tick (√) or fill in the most appropriate answer.

1. Name of PHC----------

2. Age (last birthday) ----------

3. Status of marriage 1)divorced ( ) 2) single ( ) 3) separated ( ) 4) married ( ) 5) widowed ( )

4. State of origin ----------

5. Occupation: 1) professional ( ), 2) civil servant ( ), 3) business ( ), 4) unemployed ( ).

6. State highest educational qualification 1) primary school ( ), 2) secondary school ( ) 3) tertiary school ( ), 4) no education ( )

7. Occupation of husband1) Professional ( ),2) public servant ( ),3) business ( ),4)unemployed()

8. Highest level of educationof Husband 1) Primary school ( ), 2) secondary school ( ) 3) tertiary school ( ), 4) no education ( )

9. Parity 1) null Para ( ), 2) multipara ( )

10. Religion 1) Islam ( ), 2). Christianity ( ), 3) Indigenous ( ) 4) Others ( )

11. Average monthly income in Naira----------

Section B 1: Respondents knowledge of antenatal care in PHCs. fill in the most appropriate answer or tick (√) where appropriate

12. What do you understand by antenatal care? 1) Care given to mothers ( ), 2) Care given to children ( ) 3) Care given to pregnant mothers ( ), 4) Care given to fathers ( )

13. You first heard of antenatal care through 1) Friends ( ) 2) School ( ) 3) health personnel () 4) VHVs/TBAs ( ) 5) Mass media (radio, TV, poster, brochure) ( ) 6) Others ----------
14. What is the purpose of antenatal care? 1) To care for the pregnant mothers ( ), 2) To care for the mothers ( ) 3) To care for the pregnant mothers and unborn child ( ) 4) To care for the unborn child ( )

15. A pregnant mother should book at ANC during 1)1-3 monthsof pregnancy ( ) 2) 4-6monthsof pregnancy ( ) 3) 7-9 monthsof pregnancy ( )

16. A normal pregnant woman should visit the ANC how many times before delivery
1) Once ( ) 2) twice ( ) 3) three times ( ) 4) four times ( ) 5) four times and above ( )

17. An abnormal pregnant woman should visit the ANC 1) When she wants 2) On appointment days ( ) 3) Anytime there is problem ( )

18. Information given at ANC is called 1) health education ( ) 2) infant education ( ) 3) adult education ( )

19. ANC at PHCs you have attended are conducted by 1) Staff Nurses ( ) 2) Community Health Extension Workers ( ) 3) Midwives ( ) 4) All of the above ( )

20. The illness or death of mothers and infant during pregnancy can be deacreased by ANC 1) Yes ( ) 2) No ( )

21. All except one of the following is not the services you were given at antenatal clinic? 1) Discovering pre-existing health conditions ( ) 2) Early detection of complications arising during pregnancy ( ) 3) Health promotion and disease prevention ( ) 4) Birth preparedness and complication planning ( ) 5) Infant welfare ( )

Section B 2: Respondents knowledge of delivery services in PHCs. fill in the most appropriate answer or tick (√) where appropriate

22. What is the purpose of the delivery services at PHC 1) The mother's safety ( ) 2) The baby's safety of ( ) 3) The safety of the mother and baby ( )

23. What was your source of information 1) VHVs/TBAs ( ) 2) Health personnel at ANC ( ) 3) Friend ( ) 4) Community leader ( ) 5) Mass media (radio, TV, poster, brochure) ( )

24. Delivery services at PHCs are only for 1) Women with problems in pregnancy ( ) 2) Women without problems in pregnancy ( )

25. Delivery services at PHCs are conducted by 1) Staff Nurses ( ) 2) Community Health Extension Workers ( ) 3) Midwives ( ) 4) All of the above ( )

26. Delivery at PHCs ensures identification of complications and its management 1) Yes ( ) 2) No ( )

27. Delivery at the PHCs reduces maternal/infant morbidity and mortality 1) Yes ( ) 2) No ( )

Section C1: Questions on level of adherence to ANC provided by health personal. Tick (√) the most appropriate answer

28. Do you forget to attend ANC after booking 1) Yes ( ) 2) No ( )

29. Do you attend ANC any time you have appointment1) Yes ( ) 2) No ( )

30. Do you have difficulty remembering to attend ANC 1) Yes ( ) 2) No ( )

31. Do you attend ANC in the PHC only 1)Yes( ) 2) No ( )

32.Did you take T.T at ANC 16th, 24th, 36th weeks 1) Yes ( ) 2) No ( )

33. Did you take prophylaxis for malaria at ANC 16th 24th, 36th weeks 1)Yes( ) 2) No ( )

34. Did you take drugs for intestinal parasite at ANC 16th, 24th, 36th weeks 1) Yes ( ) 2) No ( )

Section C2: Questions on level of utilisation of delivery services provided by health personal. Tick (√) the most appropriate answer

35. How many of your children have you delivered at the PHC ……..

36. Do you intend to delivery at the PHC 1) Yes ( ) 2) No ( ) pre test
36. Did you delivery at the health centre 1) Yes ( ) 2) No ( ) post test

37. If No why…….

Section D1: Questions on perceived barriers to the adherence to ANC and delivery services provided at PHCs. Tick (√) the most appropriate answer

D1:Adherence to ANC	**D2:Utilisation of delivery services**
38a. Attutide of the health care provider 1) Yes ( ) 2) No ( )	38b. Attitude of the health care provider 1) Yes ( ) 2) No ( )
39a. Availability of facilities/equipment 1) Yes ( ) 2) No ( )	39b. Availability of facilities/equipment 1) Yes ( ) 2) No ( )
40a. Language barrier 1) Yes ( ) 2) No ( )	40b. Language barrier 1) Yes ( ) 2) No ( )
41a. Cultural acceptance 1) Yes ( ) 2) No ( )	41b. Cultural acceptance 1) Yes ( ) 2) No ( )
42a. Acceptance of the services renderedby religion 1) Yes ( ) 2) No ( )	42b. Acceptance of the services renderedby religion 1) Yes ( ) 2) No ( )
43a. Acceptance of the services rendered by husband's 1) Yes ( ) 2) No ( )	43b. Acceptance of the services rendered husband's 1) Yes ( ) 2) No ( )
44a. Cost of transportation 1) Yes ( ) 2) No ( )	44b. Cost of transportation 1) Yes ( ) 2) No ( )
45a. Cost of service 1) Yes ( ) 2) No ( )	45b. Cost of service 1) Yes ( ) 2) No ( )
46a. Social support 1) No ( ) 2) Yes ( )	46b. Social support 1) No ( ) 2) Yes ( )
47a. Acceptance of the services renderedby mother in-law's 1) Yes ( ) 2) No ( )	47b. Acceptance of the services rendered by mother in-law's 1) Yes ( ) 2) No ( )
48. ignorant about the existing services in ANC 1) Yes ( ) 2) No	
49. Schedule of ANC 1) Yes ( ) 2) No ( )	
50. Proximity of ANC 1) Yes ( ) 2) No ( )	
51.Transportation to nearest ANC service 1) Yes ( ) 2) No ( )	
52.Time spent before ANC service (minutes) 1) ≥ 30 ( ) 2) < 30 ( )	

Section E Questions on perceived benefits of adherence to ANC provided at PHCs. Tick (√) the most appropriate answer

53. Adherence to ANC will make me remain healthy throughout pregnancy1) Yes( )2)No()

54. Adherence of ANC will enabled me to learn about nutrition, personal hygiene, immunisation, prevention of malaria, danger signs and anaemia in pregnancy1) Yes( ) 2)No()

55. Benefit from ANC will assist me to make decisions about my pregnancy on time
1) Yes ( ) 2) No ( )

56. Benefit from ANC will help me know at each stage of my pregnancywhat to expect, 1) Yes ( ) 2) No ( )

57. Benefit from ANC will help me identify signs and symptoms of complications of pregnancy early 1) Yes ( ) 2) No ( )

58. Benefit from ANC will make me deliver my baby with a trained health provider
1) Yes ( ) 2) No ( )

Answer the following questions under section F: Benefits of utilisation of delivery services by ticking (√) against the most appropriate words. Agree (A), Strongly Agree (SA), Disagree (D), Strongly Disagree (SD), No idea (NI).

Item:	SA	A	D	SD	NI
59. Delivery at PHCs is by a skilled health workers					
60. Delivery at PHCs reduces maternal morbidity					
61. Delivery at PHCs reduces maternal mortality					
62. Delivery at PHCs reduces infant morbidity					
63. Delivery at PHCs reduces infant mortality					
64. Delivery at PHCs ensures management of complications					
65. Delivery at PHCs ensures adequate child spacing					

ÌWÉ IBÈÉRÈ FÚN ÌWÁDÌÍ

ABALA ÀWỌN NỌ̀ỌSÌ, University of Ibadan

Olufẹ,

Ọmọ-iwe ile-iwe giga ni ile-iwe ti o wa loke. Mo n ṣe iwadi kan lori abajade ti Idarẹ pẹlu ọpọlọ lori abojuto abojuto abojuto Antenatal Care ati iṣamulo ti awọn iṣẹ ifijiṣẹ ni awọn ile-iṣẹ ilera ti o yan, ni Ipinle Eko. Awọn idahun ti ododo ati otitọ fun awọn ibeere / awọn ohun kan yoo jẹ ti o ṣe pataki julọ. Iwọ yoo ṣe idasiran si iwadi ti yoo yà gẹgẹbi ipilẹ fun awọn ẹkọ siwaju sii ni ẹgbẹ pataki ti awọn obirin. Gbogbo alaye ni a le ṣe abojuto; ko pe orukọ rẹ.

IPIN A : KỌ ÌDÀHÙN TÍ O BOJU MU TÀBÍ FI AMIN MÁÀKÌ [ ] SIBI TÍ O YẸ

1. Orúkọ PHC_____
2. Ọjọ́ orí (Èyí tí o ṣe gbèyìn)_____
3. Ipò ìgbéyàwó i. gbéyàwó [ ] ii. Dáwà [ ] iii. Pín yà o [ ] iv. Kò sílẹ̀ [ ] v. Opò
4. Ìpínlẹ̀ tí o tí wá _____

5. Iṣẹ ile ọkọ: i. Onimọ̀ [ ] ii. Osiṣẹ ìjọba [ ] iii. Asòwò [ ] iv Ainise [ ]
6. Sọ ipò ìwé òye ẹrí nínú ẹ̀kọ́ i. Alakọbẹ̀rẹ̀ [ ] ii. Ṣekondiri [ ] iii Ile eko giga [ ] iv Ko si eko o [ ]
7. Iṣe ọkọ: i. onimọ [ ] ii. Osiṣẹ ìjọba [ ] iii. Asòwò [ ] iv Ainise [ ]
8. Ipi ọkọ nínú ẹ̀kọ́ i. Alakọbere [ ] ii. Sekọndiri [ ] iii Ile eko giga [ ] iv Ko si eko o [ ]
9. Se ẹ ti loyun rii i. Oyun akoko ii. Melo
10. Ẹ̀sìn: i. Mùsùlùmí [ ] ii. Kristẹnu [ ] iii. Ìbílẹ̀ [ ] iv. Omiran [ ]
11. Owó osù ní naírà_____

ÌPÍN B1:ÒYE OLUDAHUN NÍPA ANC NI PHCs

12. Kí ni oyé o nípa ANC? (i) Itọjú fun àwọn ìyá (ii) Ìtọ̀jú fún àwọn ọmọ kékeré [ ]
(iii). Itọjú fún àwọn alaboyun [ ] (iv) Itọjú fún àwọn baba [ ]
13. Mo gbọ nípa ANC ní i. ọ̀dọ̀ ọ̀rẹ́ [ ] ii. Ile ìwé [ ] iii. Osiṣẹ èto ìlera [ ]
iv. VHU/ TBA [ ] v. Telifisan, Redio, ìwé aworan [ ] vi. Omiran [ ]
14. Kí ni ìdí ti ANC fi wa? (i) láti tọjú àwọn alaboyun (ii) láti tójú àwọn ìyá
(iii) láti tọ́jú alaboyun àti ọmọ inú rẹ̀ [ ] (iv) láti tọ́jú ọmọ inu alaboyun [ ]
15. Aláboyún ní láti regisita/kọ orùkọ rẹ̀ silẹ̀ ni ile ìwósan ANC ni gba ti (i) Ni osu kiini si kẹ́ta (First Trimester) [ ] (ii) osu kẹrin si kẹfa (Second Trimester) ( ) (iii) osu keje si kesan (Third Trimester) [ ]
16. Ìgbà mẹ́lò lo yẹ kí alaboyun ti ara ẹ le kanpe láti lọsi ile ìwósàn ANC koto kó tó bí ọmọ inú rẹ̀? (i) ẹkan [ ] (ii) igbe meji [ ] (iii) igbà emeta [ ] (iv) ìgbà kẹrin [] (v) ìgbà marun [ ]

17. Aláboyún ti ara rẹ o le dada ni láti lọ si ile iwòsàn ANC? (i) Ìgbà to ba fẹ [ ]
(ii) ijọ ti wọn da fun [ ] (iii) ìgbà kugba ti isọ̀rọ̀ ba yọọ [ ]
18. Kiini won pe ti wọn fún ní ilé ìwósan ANC (i) Ẹkọ́ ìtójú ara [ ] (ii) Èkó ọmọ okoko [ ]
19. Àwọn wo lo da yin lo wun ni ANC ti PHCS lo lo (i) osiṣe Nọiṣi [ ] (ii) Aàwọn Oṣiṣẹ ile ìwósàn ni ìlú [ ] (iii) Àwọn obinrin Agbàẹbí [ ] (iv) gbogbo ẹ pátá [ ]
20. Ìwòsàn ANC ma ran lọ wọ làti dikun Iku ojiji alaboyún àti ọmọ inú rẹ (i) bẹ́ẹ̀ni [ ] (ii) bẹ́ẹ̀ kọ [ ]
21. Èwo nínú àwọn iṣé wọn yìí ni igi ti wọ́n fun yín rara ni ilé ìwòsàn ANC? (i) Dida aisan tio wa ni ara tele mo [ ] (ii)Itete da ijamba ti ole sele lara alaboyun [ ] (iii) Eto ite siwaju ilera ati didena aisan [ ] (iv) Ipa lemo ono bibi ati imura de ijamba omo bibi [ ] (v) Itoju omode [ ]

IPIN B 2 OYÉ OLUDAHUN TI BÍBÍ ỌMỌ NI PHCs

22. Kinni ìdí ti ètò bíbí ọmọ fi wa ni PHC? (i). Láti jẹ́ ki nǹkan kan ma ṣe alaboyun [ ] (ii)Láti ripe nǹkan ka nose ọmọ [ ] (ii) Láti ripe nǹkan ka nose alaboyun àti ọmọ inú rẹ [ ]
23. kini orison imo tabi eko re i. VHVs/ TBA [ ] ii. Osiswe ilera ni ANC [ ] iii. ore [ ] iv. Olori ilu [ ] v. Ero igbehun si afefe [ ]
24. Bíbí ọmọ ni PHCs wa fún (i) àwọn obinrin to ni isoro ni ìgbà oyun [ ]
(ii) Àwọn obinrin ti o ni ịsoro ni ìgbà oyun [ ]
25. Àwọn wo lo n'gba ètò ọmọ bibi ni ilé ìwosàn PHCs (i) Àwọn osiṣẹ Noisi [ ] (ii) Àwọn obìnrin Agba obi [ ] (iii) Àwọn osise ilé ìwosàn ni ilu [ ] (iv) Gbogbo ẹ pata
26. Ètò bíbí ọmọ ni PHC máa ń ṣe afihan ikolu àti itọjú rẹ (i) bẹ́ẹ̀ ni [ ] (ii) bẹ́ẹ̀kọ [ ]
27. Èto bíbí ọmo ni PHC máa dekun ikú iyá àti ọmọ ọwọ́ ẹ́ (i) bẹ́ẹ̀ ni [ ] (ii) bẹ́ẹ̀kọ [ ]

ÌPÍN C1: Àwọn ibéèrè lórí lilo ANC bịbị ti a wọn oṣịṣẹ ile ìwosaǹ mu síle fọkasi ( ) idahun ti o jẹ́ ŋo gangan

28. Ṣe o lọ si ANC ni oṣu kan to koja? 1) Bẹẹni ( ) 2) Rara ( )
29. Ṣe o lọ si ANC nigbakugba ti o ba pade? 1) Bẹẹni ( ) 2) Rara ( )
30. Ṣe o ni ịsoro ranti lati lọ si ANC? 1) Bẹẹni ( ) 2) Rara ( )
31. Ṣe o lọ si ANC ni PHC nikan? 1) Bẹẹni ( ) 2) Rara ( )
32. Ṣe o gba T.T ni ANC 16th, 24th, 36th ọsẹ? 1) Bẹẹni ( ) 2) Rara ( )
33. Ṣe o gba prophylaxis fun ibajẹ ni ANC 16th 24th, 36th ọsẹ? 1) Bẹẹni ( ) 2) Rara ( )
34. Njẹ o gba awọn oogun fun oogun-ara oṣan ni ANC 16th, 24th, 36th weeks?
1) Bẹẹni ( ) 2) Rara ( )

ÌPÍN C2: Àwọn ibéèré lórí lilo Isẹ ọmọ bịbị ti a wọn osịsẹ ile ìwosaǹ mu síle fọkasi () idahun ti o jẹ ŋo gangan

35.Ọmọ yin mélò le ti bi si ni ilé ìwòsàn PHC _____

36.Ńjẹ o ni ìró ọkan láti bí ọmọ ni ilé ìwọsàn PHC (i) Bẹ́ẹ̀ni [ ] Bẹ́ẹ̀kọ [ ]

37.Tó bá jẹ bẹkọ kíní ìdí_____

IPIN D: IBÉÉRÈ LÓRÍ IDIWỌ TÍ ALÉRÒ LORÍ BÍ A ṢE Ń LÒ ANC ÀTI IPESE ÈTÒ ỌMỌ BÍBÍ NÍ PHCY/YAN ÌDÁHÙN TÍ O BÁ YẸ GANGAN.

ANC	IPESE
38a. Ìwà àwọn osiṣe ilera (i) Bẹ́ẹ̀ni [ ] ii.Bẹ́ẹ̀kọ [ ]	38b. Ìwà àwọn osiṣe ilera (i) Bẹ́ẹ̀ni [ ] ii.Bẹ́ẹ̀kọ [ ]
39a. Ṣe èro tàbí ohun èlò wà? (i) Bẹ́ẹ̀ni [ ] ii.Bẹ́ẹ̀kọ [ ]	39b. Ṣe èro tàbí ohun èlò wà? (i) Bẹ́ẹ̀ni [ ] ii.Bẹ́ẹ̀kọ [ ]
40a. Aìgbó èdè (i) Bẹ́ẹ̀ni [ ] ii. Bẹ́ẹ̀kọ [ ]	40a. Aìgbó èdè (i) Bẹ́ẹ̀ni [ ] ii. Bẹ́ẹ̀kọ [ ]
41a. Ìsètò àwọn (i) Bẹ́ẹ̀ni [ ] ii. Bẹ́ẹ̀kọ [ ]	41b. Ìsètò àwọn (i) Bẹ́ẹ̀ni [ ] ii. Bẹ́ẹ̀kọ [ ]
42a. Ìmọ̀ àwọn ẹlẹsin nípa(i) Bẹ́ẹ̀ni [ ] ii.Bẹ́ẹ̀kọ[ ]	42b. Ìmọ̀ àwọn ẹlẹsin nípa (i) Bẹ́ẹ̀ni [ ] ii.Bẹ́ẹ̀kọ[ ]
43a. mọ̀ ọkọ nípa iṣe (i) Bẹ́ẹ̀ni [ ] ii.Bẹ́ẹ̀kọ [ ]	43b. Ìmọ̀ ọkọ nípa iṣe (i) Bẹ́ẹ̀ni [ ] ii. Bẹ́ẹ̀kọ [ ]
44a. Iye owo moto i. o wọn [ ] ii. Ko won [ ]	44b. Iye owo moto i. o wọn [ ] ii. Ko won [ ]
45a. Iye owo iṣe i. o wọn [ ] ii.lo wọn [ ]	45b. Iye owo iṣe i. o wọn [ ] ii.lo wọn [ ]
46a. Igbajowo àwọn ènìyàn (i) Bẹ́ẹ̀ni [] ii.Bẹ́ẹ̀kọ[ ]	46b.Igbajowo àwọn ènìyàn (i) Bẹ́ẹ̀ni [] ii.Bẹ́ẹ̀kọ []
47a. Ìmọ̀ ìyá ọkọ ta bíìya ìyáwo ètò iṣe (i) Bẹ́ẹ̀ni [ ] ii.Bẹ́ẹ̀kọ [ ]	47b. Ìmọ̀ ìyá ọkọ ta bíìya ìyáwo ètò iṣe (i) Bẹ́ẹ̀ni [ ] ii. Bẹ́ẹ̀kọ [ ]
48.Ṣe o gba gbọ nípa ANC (i) Bẹ́ẹ̀ni [ ] ii. Bẹ́ẹ̀kọ [ ]	
49.Jí jínà sí tòsí iṣe ANC (i) < 412 [ ] (ii) 4-759 (iii) > 896	
50. Ipo ọ̀nà sí ANC tí o súmọ́ i. O baramu [ ] ii. Ko baramu [ ]	
51. ṣe moto èrò de ANC tí o súmọ (i) ẹẹkọpọọkan [ ] ii. Ojojumọ [ ]	
52. Díduro fún iṣe ANC (i) >30 [ ] (iii) < 30 [ ]	

IPIN E: ÌBÉÈRÈ LÓRÍ ANFÀÀNÍ ITỌJÚ OYÚN TI PHCS GBÉ KALẸ̀

Fi àmin [ ] si ìdahùn tí o yẹ

53. Ṣíṣe itojú oyun máà kẹ́ kiara mi le ni gbogbo àsikò iloyún (i) Bẹ́ẹ̀ni [ ] ii. Bẹ́ẹ̀kọ [ ]

54. Liloọ ilé ìwòsàn itojú oyún máà jẹ kí n mọ nípa oúnjẹ jíjẹ, itojú ara, gbígbà abẹrẹ ajẹsara, didena iba, ami ewu àti ani ẹjẹ lára nínú oyun (i) Bẹ́ẹ̀ni [ ] ii. Bẹ́ẹ̀kọ [ ]

55. Nínú oyé láti ile ìwòsàn itọjú oyun ran mi lọ́wọ́ láti ṣe ipinnu lóri oyun mi lasiko .

(i) Bẹ́ẹ̀ni [ ] ii. Bẹ́ẹ̀kọ́ [ ]

56. Nini oye láti ile ìwòsàn itọjú oyun yóò jẹ ki n mọ ohun ti mo ń retí ni ipele kọọkanoyun ki a

(i) Bẹ́ẹ̀ni [ ] ii. Bẹ́ẹ̀kọ́ [ ]

57. Nini oyé láti ile ìwòsàn itọjú oyun yóò jẹ ki n mọ ami àti apẹ àwọn aisẹdeede ni nínú oyun ki a (i) Bẹ́ẹ̀ni [ ] ii. Bẹ́ẹ̀kọ́ [ ]

58. Níní oye láti ile ìwòsàn itójú oyun yoo jẹ kí n bí ọmọ mi làti ọwọ ẹni ti o kọ́ṣẹ́ mọṣẹ́ ìwòsàn.

(i) Bẹ́ẹ̀ni [ ] ii. Bẹ́ẹ̀kọ́ [ ]

IPIN F: DAHÙN ÀWỌN ÌBÉÈRÈ ABALA F.

Àǹfàání lílò àwọn agbẹ̀bí nípa fífí ami [ ] síwájú ọ̀rọ̀ tí o boju mu ju . Mo fara mọ (A) mo fara mọ daadaa (SA) Emi ko faramọ (D) mo lodi sii dada (SA) ko yemi (Ni)

	Items	**SA**	**A**	**D**	**SD**	**NI**
59.	Igbẹbi ni ile ìwòsàn ìjọba (PHCs) wa láti ọwọ olugbẹbi tí o mọṣẹ					
60.	Igbẹbi ni ile ìwọsàn ìjọba (PHCs) din iku aboyun kù					
61.	Igbebi ni ile ìwòsàn ìjọba (PHCs) din aìsan aboyun ku.					
62.	Ọmọ bíbí ni ile ìwosàn ìjọba (PHCs) dín aìsàn ọmọ kékeré kú					
63.	Ọmọ bíbí ni ile ìwòsàn ìjọba (PHCs) ń dín ikú majẹsin (ọmọ kekeré) kù					
64.	Ọmọ bibi ni ilé ìwòsàn ìjọba (HCS) / bojúto àwọn ìṣòrò o lee wáyé					
65.	Ọmọ bíbí ni ilé ìwòsàn ìjọba (PHCS) n bojútó ifeto sọmọ-bibi.					

APPENDIX I

APPROVAL DATES: 31-12-2014 to 31-12-2015. Extension to 31-7-2016

Participant Consent Form : ADM/DCST/HREC/2256

Title of Research:Outcome of reminder calls and home visits on adherence to antenatal care and Utilisation of delivery services in primary health centers in Lagos state, Nigeria.

Name and affiliation of researcher: This research will be conducted by Ogechi Helen Abazie, aPh.D student of the University of Ibadan, College of Medicine, Faculty of clinical sciences, Department of Nursing.

Introduction:Reminder calls and home visits, during ANC has long been recognised as an important intervention step in preventing illnesses and deathamong women during pregnancy, delivery and in the post-partum period.

Reason(s) of the research: This study is to assess the outcome of reminder calls and home visits on adherence to ANC and utilisation of delivery in primary health centers in Lagos state, focusing on increasing the number of women that utilise ANC and delivery services in PHCs

Procedure of the research: Your opinion about adherence to ANC and utilisation of delivery services in PHCs is tapped with a structured questionnaire, reminder call, record of ANC and home visit. Your answer should be based on past experienceand opinion. Modules on benefits and barriers of utilisation ANC, delivery services, identification of indications for complications during pregnancy will be used as intervention measures for the experimental group.

Benefit(s) from the research: Each participant have a unique opportunity to express their opinions about adherence on ANC and utilisation of delivery services in PHCs.The findings from the study will be presented to the Ikorodu, Epe, Badagry administrative divisions and Lagos state department of health and women welfare to influence decision making on adherenc on ANC and utilisation of delivery services, and identification of complications during pregnancy. Also to increase health promoting activities that will influence the pregnant women's health seeking behavior positively.

Risks from the reaserch: It will be aquestionnaire and educational intervention type of project. No harm whatsoever will bepredicted on any of the participants.

Confidentiality: Your name or identifiable would not appear in any reports or publications. Data collected will only be viewed by the researcher, stored according to the Data Protection Act (1998) and destroyed after 5 years following data storage regulations.

Participant'swillingness:If you decise not to participate in this research, no penalty will be attached to your decision. It is entirely voluntary to participate in this research.No fees will be paid to you for participating in this research. You can choose to withdraw from the research at any time.

What Happens to Research Participants and Communities when the Research is over

The researcher through the administrative divisionswill inform you of the outcome of the research. No conflict of interest.

Person Obtaining Informed ConsentStatement:
I have fully explained this research/study to the respondent and gave sufficient information, including the risk and benefits, to make an informed decision.

Date ……. Signature …….

Statement of Person Giving Consent:

I have read the description of the research and it was explained to me. I understand that my participation is voluntary. I know enough about the purpose, methods, risks, and benefits of the research study to judge that I want to take part in it. I understand that I may freely stop being part of this study at any time. I have received a copy of this consent form to keep for myself.

Date …….. Signature ……..

Date:…….. Right thumb print ……

Please contact the researcher,for further enquiry:

Researcher's Contact

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APPENDIX 11

The package used to provide information on adherence to ANC and utilisation of delivery services among pregnant women

Adapted from World Health Organisation ANC model outlined in clinical guidelines and other reviewed literature on antenatal care and delivery

By

OGECHI HELEN ABAZIE

Module 1: knowledge and benefits of adherence to ANC and utilisation delivery services, changes in first trimester and activities at ANC, alsoidentificationof health conditionsthat were present before pregnancy (e.g., measure blood pressure, check weight and nutrition status, anemia, syphilis, and HIV status).

Module 2: Changes in second trimester, causes and identification of complications arising early during pregnancy and risk factor.Benefits of adherening on ANC and utilising delivery services(example, observe for pre-eclampsia, and gestational diabetes etc.)

Module 3: Changes in third trimester,information on how to promotion health and preventdisease (example, malaria prevention and treatment, counseling on nutrition, tetanus vaccine, micronutrient supplements, and counseling on family planning). Benefits of utilising ANC and delivery services

Module 4: Preparation forbirth and planningto prevent complications (example, emergency and birthplan, breastfeeding counselling. Changes during labour, postpartum, family planning methods available and baby's immunisation

The broad objective of these modules is to empower women with information on benefits of adherence to ANC and delivery services how to identify danger signs during pregnancy and treatment options.

Module 1

Benefits of utilising ANC and delivery services,changes in first trimester and Activities at ANC

Objectives

The pregnant women at the end of discussionwill be able:

1. To discuss the benefits of adherening on ANC and skilled birth attendance utilisation in PHCs
2. To discuss the activities at ANC and when it is done
3. To describe changes in first trimester of pregnancy

Teaching Aids:Posters and models

Activities:

- Welcome of participants
- Researcher introduces self and research assistants
- Participants introduce themselves
- Introduction of the topic for discussion
- Group participation in the discuss

Method of teaching: Group discussion guided by the module

Duration of the teaching: 30 minutes

Benefits of utilising ANC and delivery services

Primary health centers give essential health care that is comprehensiveto the people where the live and work at a price that the people can pay for at every stage of their development. It should be the first point of health call for all. Presently each political ward in Nigeria should have a PHC. The services rendered at PHCs include immunisation, parinatal and child health services, infant welfare, sanitation, and better ways to plan yourfamily etc. ANCand delivery arepartof the services at PHCs, and they areeffective in decreasing maternal and perinatal deaths and disease, disorder or disability.

Prevented, detected and treatment of most health problems in pregnant women can be carried out during ANC visits with trained health workers. Presently WHO recommends eight ANC visits, for every pregnant women.During the visits activities such as vaccinationwith tetanus toxoid, screening, treatment for infections, identification of complicationsand counselling on indication signs are carried out.The purpose of antenatl care is to avert or treat conditions that may threaten the health of the fetus/newborn and/or the mother, supporting the women through pregnancy and child birth.Also ANC can help provide the newborn child positive intra and extra uterine life. ANC most important activities are in three general areas:

1. Screeningto increase the possibility of specific adverse outcomese.g. health and socioeconomic conditions.
2. Knownbeneficial therapeutic interventions should be provided.
3. Educationand preparing thepregnant women on safe delivery of their babies and how to manage complicationsin pregnancy.

-ANC will help in discovering existing risk factors and other deviations from normal. Emphasis on preventive care and optimal self-care which will help to prevent low birth rate and infant mortality

-Antenatal educational goals are to establish lifestyle behaviours for optimal health, prepare psychologically for pregnancy and the responsibilities that come with parenthood, identify, minimize and treat risk factors, screen health hazards in workplace and home such as chemicals, radiation, lead, etc., obtain genetic counselling for inherited diseases.

- Self-careeducation: Urinary tract infectionsprevention, Kegal exercises, Breastfeedingpreparation, Dental Health (Fluoride), Immunisations, Physical activity, Body mechanics and posture and, Rest and relaxation (left side lying), Employment and travel, Clothing, Medications and herbal preparations, Avoidance of alcohol, cigarettes, drugs, Warning signs of potential complications, Nutrition, Caffeine in moderation, Personal hygiene, Seat belt can and should be worn at all times throughout pregnancy.

-Pregnancydanger signs:Persistent Vomiting, Gushing of Fluid from VaginaSuddely, Vaginal Bleeding, Abdominal Pain, Pyrexia of 101°F or 38.3°C, Dysuria, Dizziness, Blurred Vision (Diplopia), Convulsion, Headache, Oedema of Face, Hands, Legs, Feet, Epigastric pain, Muscular Irritability, Oliguria (low output of urine), Absence of Fetal Movement.

-Development of a birth plan:Get a support person, Determine preferences for delivery including type of anesthesia, and Enroll in childbirth classes

- ANC helps to ensure satisfactory communication with the health worker (nurses)

-The health worker will demonstrate mutual respect and support to the pregnant women

- ANC ensure understanding of the pregnant women insufficient (physical, social, psychological) functioning

It enables well balanced collaboration between the women and health workers

-ANC enables the woman to express her autonomy

-Helps the women to share ideas, information, and expressing her emotional needs.

-Recognising preterm labour: It can occur after the 20th week and before the 37th week;uterine contractions if untreated can cause the cervix to open earlier resulting in preterm labour. The symptoms are pain/cramping in the abdomen, constant back pain, and pelvic pressure.

-Variationsof prenatal care: Diet, and Psychosocial support systems,effect of culture, Emotional response, Clothing, Physical activity, Rest, and Sexual activity, alsodifferences in age.

Adolescents: there are compliance issues and social/psychologic barriers also their proparbility of receiving adequate prenatal care is less than older women.

Older womenmore than 35 years: multiparous women, primiparous women are more likely to have planned but some may have fertility issues.

-Before conception nutritional requirements: In terms of embryonic and fetal organ developmentit is crucial in first trimester. Make sure adequate nutrients are available for developing fetusby eating well before conception. Intake of folic acid is important in preconception period because it can prevent neural tube defects

-Nutrient Needs During Pregnancy:1 quart of FLUID a day, 60 grams or 6 servings of PROTEIN a day, Energy needs: increase of 300 calories a day.

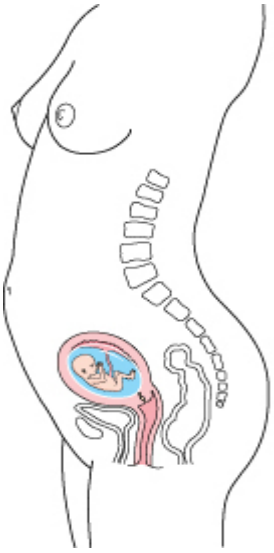
-Pica:Abnormal cravings for things that are not food such as dirt, rocks, laundry detergent, etc.

-ANC empowers the women with benefits of delivery at PHCs with skilled personal

There will be free delivery pack, and services. The woman will have sense of belonging because her physical, social and psychological needs will be met.

-Reduces cases of morbidity and mortality among prenatal women

First Trimester of PregnancyChanges (1to 12Weeks)



Hormonal changesduring the first trimesteraffect every organ or system in the body. The discontinuation of menses is a clear sign that pregnant have occurred.

Changes may include:

- Tiredness

- Sticking outof the nipplesmay occur, with the breasts being tender and swollen.
- Vomiting (morning sickness) with or without Nuasea
- Cravings or distaste for certain foods
- Mood swings
- Constipation (trouble having bowel movements)
- Passing urine more often
- Headache
- Heartburn
- Weight gain or loss

Daily activities might lead to changes as the body change, like sleepingearlier or eating frequent, small meals. As pregnancy progressesmost of these discomforts will go away. Beinning pregnant before will make some womennot to feel any discomfort. Just as each woman is different, sois each pregnancy.

Activities in the Trimesters

Table 2.2:The ANC eight vist model outlined adopted from WHO clinical guidelinesGoals

	First trimester Visit 1; 8 to 12thweek	Second trimester Visit 2; week 20 Visit 3; week 26	Third trimester Visit 4; week 30, Visit 5; week 34, Visit 6; weeks 36, Visit 7; weeks 38,	Third trimester Visit 8; week 40. Coming back for delivery at week 41 if not given birth
	Confirm pregnancyand EDD, classification of women for basic ANC (8visits) or more. Preventive measures after screening / treatment. Cultivate a delivery and emergency plan. Advise and counsel	Maternal and fetalcheck. Rule out PIH and anaemia. Give preventive measures. Modify birth and emergency plan. Advise and counsel	Maternal and fetal well-being check. Exclude PIH, anaemia, multiple pregnancies. Give preventive measures. Modify birth and emergency plan. Advise and counsel	Maternal and fetal well-being check. Exclude PIH, anaemia, multiple pregnancy, malpresentation. Give preventive measures. Modify birth and emergency plan. Advise and counsel

Activities: assess emergency signs, give adequate treatment, and refer to hospital if needed

Collect data (obser and records	Examine important symptoms.	Examine important symptoms.	Examine important symptoms.	Examine important symptoms.

history)	Psychosocial, medical and obstetric history taken. Confirm pregnancy and calculate EDD. Categorise all women (after test results)	Note past complications and management during Pregnancy. Re- Categorise if needed	Note past complications and management during Pregnancy. Re- Categorise if needed	Note past complications and management during pregnancy. Re- Categorise if needed
Investigation (look, listen, feel)	Complete investigations general, and obstetrical, BP	Anaemia, BP, fetal growth, and movements	Anaemia, BP, fetal growth, multiple pregnancy	Anaemia, BP, fetal growth and movements, multiple pregnancy, malpresentation
Screening and Tests	Haemoglobin Syphilis, HIV Proteinuria Blood/Rh group* Bacteriuria*	Bacteriuria*	Bacteriuria*	Bacteriuria*
Treatments	Syphilis ARV if eligible Manage urinary microganism if recommened*	Antihelminthic**,ARV if eligible Manage urinary microganism if recommened* Prophylaxis for malaria manage intestinal parasite	ARV if eligible Manage urinary microganism if recommened*	ARV if eligible If breech, ECV or referral for ECV Manage urinary microganism if recommened*
Protective Measures	Tetanus toxoid Iron and folate+	Tetanus toxoid, Iron and folateIPTpARV	Iron and folateIPTp ARV	Iron and folate ARV
Health education, and counseling	Use of alcohol and tobacco, nutrition, safe sex, rest, sleeping under ITN, birth and emergency plan	Birth and emergency plan, reinforcement of previous advice	Birth and emergency plan, infant feeding, postpartum/postnatal care, pregnancy spacing,reinforcement of previous advice	Birth and emergency plan, infant,feeding, postpartum/postnatal care, pregnancy spacing, reinforcement of previous advice.

NOTE: The table above will be used for health education during all the trimesters.

Evaluation

What are the benefits of adhereing onANC and utilization of delivery services?

What are the changes that took place during first three months of pregnancy?

What are the activities women most carry out on their first visit to ANC?

What are the danger signs in pregnancy?

Closing and Goodbye

Finally, congratulate the women, thank them for their participation, their patience, and their time and invite them to attend the next meeting.

Module 11

Changes in second trimester, Causes of complications in pregnancy and risk factors

Objectives

At the end of the discussion:

1. Pregnant women will know the changes that take place during the second trimester
2. The participants will be able to say the causes of complications in pregnancy
3. The participants will be able to describe the risk factors of the complications
4. Pregnant women will be able to mention different types of complications

Teaching aids: Poster, information booklets and pictures of pregnant women with complications

Methods of teaching: Group discussion guided by the module

Duration of the teaching: 30 minutes

Activities:

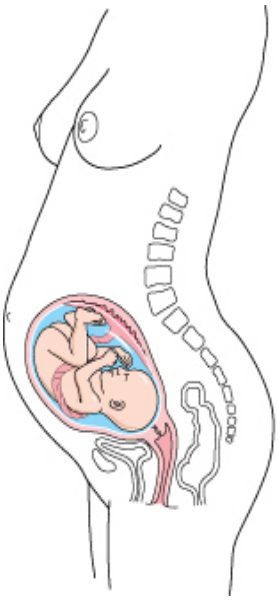
- Welcoming of participants
- Researcher introduce self and research assistant
- Participants introduces themselves
- Review of previous topic
- Introduction of the topic for discussion

Greet them warmly and congratulate them for coming again

Why pregnant women do not utilize ANC?

Does anyone know someone who is not using ANC by a skilled health worker?

Second Trimester (13- 28Weeks)



2nd trimester

The second trimester of pregnancy iseasier than the first to many women. During these monthsnausea and fatigue will resolve,the pregnant woman should always have current informations about pregnancy. Body changes are now noticeable. As the baby continues to grow,there is abdomen enlargementbefore the end of the trimester, the woman will feel the movement of the baby. As thesebody changes, take place, the woman may have:

- Generalised body pain
- Stretch marks on the abdomen, breasts, thighs, or buttocks
- Darkening of the skin around the nipples
- A line on the skin running from belly button to pubic hairline.
- Patches of darker skinon the cheeks, forehead, nose, or upper liphave. Both sides of the facehave match patches often. This is sometimes called the mask of pregnancy.
- Numbness or tingling of the handsknown as carpal tunnel syndrome.

- Signs of a serious liver problemmay present with itching on the abdomen, palms, and soles of the feet.(Inform the doctor if there is nausea, loss of appetite, vomiting, jaundice or fatigue combined with itching.).
- There could be sign of preeclampsia which will present with swelling of the ankles, fingers, and fac.(If noticed any sudden or extreme swelling or if a lot of weight is gained quickly, call the doctor).
- **Risk factors**: Before a woman becomes pregnant or during the pregnancyissuesincreasing the risk of pregnancy complications should be in the woman's medical profile. Other issues like the physical, mental health, and social issues, or a combination may relate to these pre-existing factors,(Kourtis, Read, and Jamieson, 2014).

- Parental Age:

Adolescent parents:Teenage pregnancy outcome in most cases are very poor.

Older parents:maternal age, over 50 affects pregnancy

- Contactto recreational drugs in pregnancy like environmental toxins in pregnancy example, exposure to

-Fetal alcohol syndrome are caused by intake of ethanol during pregnancy.

-Twice the risk of premature rupture of membranes, placental abruption and placenta previaare caused by tobacco smokingduring pregnancy,(Kourtis, Read, and Jamieson, 2014).

Comsuption of cancain before pregnany can lead to premature delivery,congenital abnormalities and attention deficit disorder. Before term birth and congenital abnormalities can be caused byprenatal methamphetamine exposure, (Neal, 2011).Short-term neonatal outcomeswill berevealed during investigations, also minor problems in infant neurobehavioral function and growth restriction when compared to normal infants, (Grotta, LaGasse, Arria, and Derauf, 2009). It is believed that prenatal methamphetamine use will have long-term effects on brain development, this may continue for some years, **(**Centers for Disease Control and Prevention. 2009). Later in a child's life, it was discovered that in-take of cannabis during pregnancy is associated with long term effects.

Pharmaceutical drugsexposureduring pregnancy: Risks of such outcomes as preterm delivery is increased by anti-depressants. Further information in pregnancy category e.g, Ionizing radiation.

Previous pregnanciescomplications: The tendency that they may re-occur is high.

Grand multi gravidas. There isincrease risk of precipetated labour and excessive bleeding after delivery in women with more than four pregnancy.

Previousmultiple pregnancies. Increased risk of mislocated placentain someWomen. (Neal, 2011).

Multiple fetuses, occurs when a woman, have two or more fetus in a single pregnancy.

Socioeconomic factors. Low accessibility to skilled prenatal care,have caused single mothers and other mothers in lower socioeconomic groups experience a greater level of danger in pregnancy,(Neal, 2011).

Unplanned pregnancy. May disrupt life plans,preventpreparatory care before pregnancy and delays ANC. It effect other preventive care, and worsen health and psychological outcomes for the mother and, if birth occurs, for the child, (Gavin, Holzman, Siefert, and Tian, 2009).

Pregnant Woman's Height. Incidences of preterm birth and underweight babiescorrelates with the height of the woman especially in if less than 1.5 meters (5 feet). These women can have complications like shoulder dystocia during childbirthbecause they have small pelvis, (Gavin, Holzman, Siefert, and Tian, 2009).

Weight of a Pregnant Woman's –Women have underweight babies when their weight before pregnancy is less than 45.5 kilograms (100 pounds).Obeses womenhave very large babies. The chances of developing gestational diabetes,high blood pressure, preeclampsia, experiencing post term pregnancy and/or requiring a cesarean delivery,rises withobesity, (Gavin, Holzman, Siefert, and Tian, 2009).

Pregnancy intercurrent diseases, like diabetes mellitus, systemic lupus erythematosus (SLE) or thyroid disease areconditions not directly caused by the pregnancy.

Complicated pregnancy: Complicated pregnancies are the main focus of health care specialists. (Neal, Todd 2011).Awoman's physical ability to survive pregnancycan be reduced by a range of congenital defects. The woman was born,with some of these conditions e.g, diseases of theheart or reproductive organs, and diseases acquired during the woman's life time, (Neal, 2011).

Normal pregnancy

Women with normal pregnancies,under the Dutch system of obstetric care, are taken care of by a skilled midwife in primary care, and they can decide to deliver at home or in the hospital. a

Hospital deliveryis carried out on those at risk of complicationand they are supervised by an obstetrician throughout their pregnancy,(Neal, 2011).

Causes and treatment of Complications in pregnancy

The high maternal mortality rate in Nigeria are caused by complications that occur in pregnancy which are not identified early even when identified are not effetely managed, Example includes: bleeding, infection, pregnancy induced hypertensive, obstructed labour and anaemia. The government should put in place strategies to take care of the original causes of delays in seeking, accessing and receiving healthcare at the PHCs,this will drastically reduce maternal mobility and mortality rates and the major reason of maternal death in Nigeria can be avoided, (Obinna and Olowoopejo, 2013). Mothers who have already sought pre-natal care earily, typically stand a much better chance of delivering safely. Complicationshave been the main causes of death of mothers in pregnancy and childbirth. Some of these problems may occur before pregnancy but are degenerated during pregnancy, also they can develop during pregnancy, (Obinna and Olowoopejo, 2013). That is why pregnant women should have the knowledge of signs and symptom of complications during pregnant. They can be grouped into maternal and fetal problems.

Maternal problems:

Hyperemesis gravidarum: Severe thanmorning sickness with vomiting, dehydration, and weightlose.

Signs and symptoms: vomiting, weight loss, reduced appetite, dehydration, fainting,Nausea that does not go away.

Treatment: The first line of treatment are dry, bland foods and fluids. Nausea is taken care of by drugs. Women with HGat 20th week of pregnancy, begin to feel better.Women with HG are given intravenousfluids and nutrientswhile they are in hospital. Through out pregnancy some women vomit and feel nauseated, (Women'shealth gov 2010).

Pain of the pelvic girdle: The pain can begin peri or postpartum. It is made up of multiple factors from different areas.The pain drivers are from different underlying peripheral or central nervous system.It causes laxity/stiffness of muscles, tendinous/ligamentous injury laxity and mal-adaptive body mechanics. It also involved mild impair musculo-skeletal mechanics in

gaitand weight bearing activities. In some women it can last for years resulting in a reduced tolerance for weight bearing activities,while most women the pain, resolves in weeks after delivery,(Kourtis, Read, and Jamieson, 2014).

Mangement: Many treatment options are available based on the severity. In mild cases it is managed by advicing the patient to rest, also rehabilitation and pain therapies are very important. Severe conditionwould include manageing with mobility aids, strong analgesics and sometimes surgery. Education, information and supportwere the main factors in helping women cope. (Kourtis, Read, and Jamieson,2014).

Deep vein thrombosis (DVT): In developed countries,the second common cause of maternal deathafter bleeding is DVT.Ithas an incidence of 0.5 to 7 per 1,000 pregnancies.

Causes: Physiological response to potential massive bleeding at childbirth called hypercoagulability which is seen in pregnancy is the main cause.

Treatment: Lowmolecular weightheparin, may be indicated when there are additional risk factors for deep vein thrombosis, (Prophylactic).

Anaemia: Duringthe third trimesterslevels of hemoglobin(redblood cells) are lower causing severe anaemia,management varies and includes increasingfoods containing iron, iron tablets or use of parenteral iron.

Signs and symptom: Shortness of breath,tiredness or weakness, paleness, and feeling faint. Manageing the cause of the anemia will restore the number of healthy red blood cells. Pregnant women with anemia,are placed on iron and folic acid supplements, (Kourtis, Read, and Jamieson, 2014). During ANC the iron level is checked to be sure the pregnant woman dose not have anaemia.

Infection: Certain infectionsare prone in pregnancy. The increased risk infection is because the pregnant woman's immunity is weak. But the placenta protects the fetus from harm, alsothe pregnant woman's immunity takes care of thesecondary changes in the woman, which are physiological. It includes a decrease in respiratory volumes and urinary stasis due to an enlarging uterus. (Kourtis, Read, and Jamieson, 2014). Influenza, hepatitis E, herpes simplex and malariaseverely affected pregnant women. This is indicated mainly for coccidioidomycosis, measles, smallpox, and varicella.(Kourtis, Read, and Jamieson,2014). The child can be affected as wellby some infections,(vertical transmision).

AbruptioPlacenta(Placenta separating from the uterus)

Causes: Some of the risk features are trauma,hypertension, and drug use.Also there are various causes of abruption placenta.

Signs and symptoms: Uterine tenderness, vaginal bleeding, cramping, and abdominal pain.

Management: With immature fetuses in mild cases, the pregnant woman will be under observation in the hospital.A plan to delivery the fetus immediately will take place at 36 weeks or older, or if an immatured fetus or the mother is in distress.The bleeding will stop in cases of minor separations if the preganant woman is confirmed in bed.In moderate conditionscomplete bed restmay be required. In severe cases (withpartial separation of the placenta) medical attention and early delivery of the baby is neededimmediately, (Women'shealth.gov 2010).

Placenta previa – This occurs when the cervical opening inside the uterus is partely or entirely covered by the placenta.

Signs and symptoms: Some pregnant women, had no symptoms, while othereshave vaginal bleeding without pain in their second or third trimester

Treatment:A pregnant woman who is not bleeding will reduce her activities and increase bed restwhen the diagnosed of placent previa is made after the 20th week of pregnancy. In cases of heavy bleeding, admissionof the pregnant woman may be needed to ensure stability of mother and baby. The pregnant woman is confirmed in bed until baby is ready for deliveryin conditions where the bleeding stops or is light. Cesarean section will be used for the delivery of the baby in cases of continuous bleeding or in preterm labour, (Women'shealth.gov 2010).

Severe hypertension: One of the conditions is preeclampsia, which occurs when there are pregnancy induced hypertension, proteinuria (>300 mg), and oedema. In severe preeclampsia there is a blood pressure of over 160/110mmHg (with other signs). Whileeclampsiapresent with seizures in a preeclamptic patient.

HELLP syndrome, which present with hemolytic anemia, elevated liver enzymes and low platelet count in a pregnant womanis a serious complication in pregnancy. Also it include fatty liver which is acute in a known pregnant woman with preeclampsia spectrum.

Signs and symptom: Too much protein in urine, high BP, generalised oedema, abdominal pain, blurred vision, dizziness, and headaches.

Treatment: The pregnant woman can be releaved of this condition by delivery of the baby. In mild cases induction of labour can be used if pregnancy is 37 to 40 weeks.Close observation of the pregnant woman and fetus is undertaken by the doctor if the pregnancy is too early. Bed rest at home or in the hospital with medicationswill help to lower the woman's blood pressure, and preventseizures, (Women'shealth.gov 2010).

Problems of the Fetus

Ectopic pregnancy: Usually occur,with implantation of fertilized eggespecially in the fallopian tubeoutside of the uterus.

Causes: The major cause of the problem is unknown but factors like smoking, advanced maternal age and blockage or damage to the fallopian tubes before conceptionare some of the risk factors, (Kourtis, Read, and Jamieson, 2014).

Signs and symptoms: Pain in the abdomen, shoulder, vaginal bleeding, dizziness or fainting.**Management:**The egg cannot developif there is no spontaneous resolution. To prevent damage or death to the mother,the ectopic tissue is removed using medications or surgery, (Women'shealth.gov 2010).

Pregnanciesthat are multiple: They cansharing same chorion in that case it is known as monochorionic, and there is a high risk of twin-to-twin transfusion syndrome. Apart from sharing the same chorion they can share the same amniotic sac known as the monoamniotic which is a risk factor to umbilical cord compression and entanglement. Impairing function of internal organs occurin rare cases, especially inconjoined twins,(Kourtis, Read, and Jamieson, 2014).

Infectionstransmittedvertically: The pregnant women's immunity protects theembryo and fetus because they don't have a functioning immunity. Most of the infections that occur to the fetus during pregnancy is due topathogenscrossing the placenta barrier.Some dangerous Micro-organisms that produce minor illnessin the mother can result in spontaneous abortion or growing

disorders for the developing embryo or fetus. The fetus is at riskfor many infectionsat spercific stages of pregnancy and most of the infections are not always visible. Transplacental infection can be the cause of many infections, the term TORCH is used for those infections, (Kourtis, Read, and Jamieson,2014).

Through the maternal genital tract the babies are infected because they are exposed to both the mother's blood and fluids during delivery. Sexually transmitted disease which are caused by blood-borne microorganisms (Hepatitis B, HIV), organisms associated with (e.g., Gonorrhoea and Chlamydia), and normal fauna of the genito-urinary tract (e.g., Candida) are among those commonly seen in infection of newborns. (Kourtis, Read, and Jamieson, 2014).

Evaluation

What are the physiological changes that take place in the second trimester?

Risk factors that can cause complications in pregnancy?

What are the signs and symptoms of the complications in pregnancy?

Problems experienced in pregnancy are caused by?

Closing and Goodbye

Finally, congratulate the women, thank them for their participation, their patience, and their time and invite them to attend the next meeting. Reminder calls to respondents who were not around and home visit to some who did not answer their call.

Module 111

Changes in third trimester, identification and prevention of complications of pregnancy

Objective of the session

The pregnant woman at the end of the discussion:

1. Will be able to understand the changes at the third trimester
2. Will be able to enumerate how to prevent complications in pregnancy
3. Will be able to recite the danger signs and how to identify them.

Teaching Aids: Posters, information booklet, pictures of pregnant women showing danger signs.

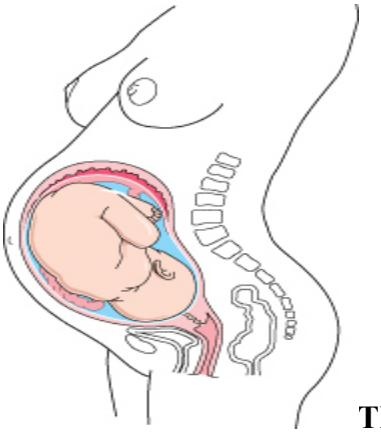
Methods of teaching: Group discussion guided by the module

Duration of the teaching: 30 minutes

Activities

- Welcoming of participants
- Researcher introduces self and research assistant
- Participants introduce themselves
- Review of previous discussion
- Introduction of the topic for discussion

Week 29 to Week 40 of pregnancy



Third trimester

During the third trimester some of the discomfort of second trimestercan continue.Urinary frequency and difficulty inbreathingwill be seen in many women. As the baby get bigger, there will be more pressure on organsin the body. Some of the new changes noticed in the third trimester include:

- Breathing difficulty
- Indigestion
- Ankles, fingers, and faceOedema
- Pregnancy induced hypertension
- Hemorrhoids
- Breaststenderness, which may leak a watery pre-milk called colostrum
- Sticking outof the abdomen and buttous
- insomnia
- Lightening

- Uterine contractions, which can be a sign of real or false labour
- Effacment of the cervix takes place as labour sets in. This helps in preparation of the cervix for delivery. As the due date draws closer,the health care provider examines the vaginal to determine progress.

Pregnancydanger signs:

Danger signs of pregnancy include nausea occurring in the first 3 months, indigestion, and frequency of urine, backache, tiredness breast tenderness and swelling.Some of those conditions are uncomfortablefor most women during pregnancy. Awareness of these danger signs can help the pregnant woman to know when she needsextra care from her healthcare provider.

Call the health care provider if the following conditions occur earlier than 37th week of pregnancy:

- Severe pain, pressure or crampingin the abdomen.
- Regular uterine contractions that are less than 15 minutes apartor happen more than 4 times in an hour.
- Fluid drainingfrom the vagina.
- Bleeding per vagina
- Nausea followed by vomiting
- High temperature of above 100°F (37.8°C)
- Severe headache lasts for several days
- Blurring vision
- Reduced movement and kicking by the baby
- Weight gain of about 3 to 5 pounds within 5 to 7 dayswith oedema of the feet, ankles, face, or hands.
- Seizures

Complications preventionin pregnancy

Make sure you register for ANC in a PHC or with a skilled provider. Inform the health provider about previous health problems and its treatment. Note that during pregnancy some of the drugs used to treat health problems could be injurious so should be avioded.The pregnant woman

should be able to discuss any previous health problems with the health care provider. When the health conditions are taken care of with adequate prenatal care, the woman will have a healthy pregnancy, labour and baby.

Nutrition in Pregnancy

1. A pregnant woman should take about 80–100 grams of high quality protein daily.Every cell of the baby's body is made up of protein which can be gotten from slim meats or vegetarian combinations.
2. A pregnant woman should take a minimum of 2,400calories every day to ensure that the body do not burn all the protein for energy. Real butter should be used for bread during pregnancy, because it contains natural and concentrated source of fat the body can use.
3. In pregnancy more sodium is needed,while it should be reduced in the cases of oedema and increased blood pressure.Regulation of sodium can be carried out during pregnancy in a normal condition. Food items that can supply the body with sodium should be part of the pregnant woman daily diet.
4. Daily the pregnant woman should take four cups of milk and two eggswhich will provide 50% of protein and supplies the baby with essential nutrients for growth. Alternative plans can be made by pregnant women who are vegetarians and have lactose intolerant.
5. It is advisible for a pregnant woman to always eat whole grains rather than refined and processed grains, e.g brown rice, whole wheat flour, bran and oats, they have about 1/3 more nutrients than their processed or enriched grains.
6. A pregnant woman should make sure she include fresh fruits, vegetables and natural juices, both dark green and yellow to her daily diet. Also she should take a lot of water especially when she is thirsty. Note that fruits and vegetables contain water, as well as important nutrients to help the body fight infection and metabolize other nutrients.Malnutrition occurs in pregnancy when

inadequate diet is taken and it is important for the pregnant woman to know that all the nutrients are interdependent.

Evaluation

- What are the physiological changes that take place in the third trimester?
- What are the danger signs a pregnant woman can see?
- How can you prevent complications in pregnancy?
- What are the foods you most eat during pregnancy to prevent complications?

Closing and Goodbye

Finally, congratulate the women, thank them for their participation, their patience, and their time and invite them to attend the next meeting. Reminder calls and home visit to respondents who were absent.

Module IV

Delivery services and changes during labour, postpartum, family planning methods available and baby's immunization

Learning objectives

The pregnant women should be able:

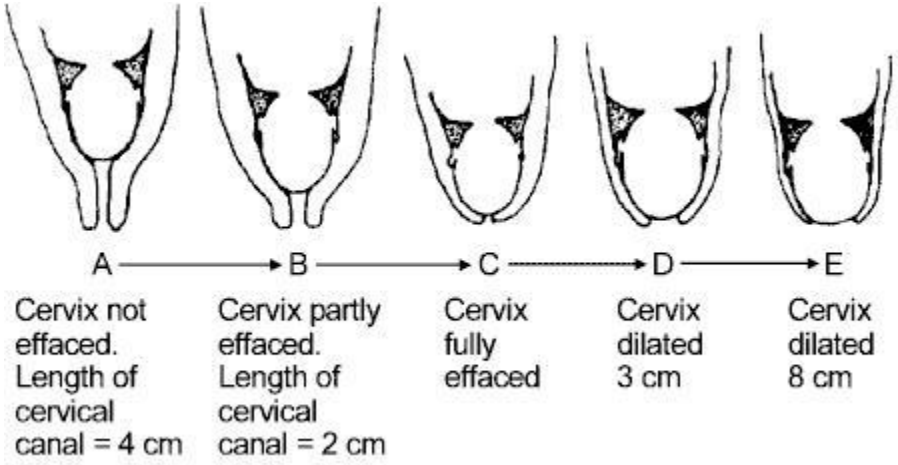
1. To discuss changes during labour
2. To identify changes during post-partum
3. To describe the family planning methods available
4. To discuss importance of ANC during post-partum

Teaching Aids: Posters, information booklet

Duration of the teaching:one hour

Activities

- Welcoming of participants
- Researcher introduce self and research assistant
- Participants introduces themselves
- Review of previous topic
- Introduction of the topic for discussion



Changes during labour

Contractions of the uterus: The tightening and relaxing of the uterus, in labour reasonable the servere pain during menses. Braxton Hicks contractions occur during pregnancy, and they are painless tightening of the uterus. Labour startswhen ther are regular, painful contractions that feel stronger and last more than 30 seconds. As the hours of labour increase, so the duration of contractions become longer, stronger and more frequent. During a contraction, the muscles in the womb tighten and causes increase in pain. The abdomen, will feel harder on touch and ease when the contracting muscles relax. As contractions continues the cervical canal is opening preparing to allow the passage of the fetus.A normal pregnant woman will be adviced to come to the hospital when the contractions are strong, regular and frequent. That is when the contractions last 30-60 seconds and occur every five minutes.

Contractions can be experiencedwithout the cervix dilating. Some of those condition occur when

- Contractions are irregular
- Contractions not getting stronger
- Contractions stop with change in position, massage, walking, eating or drinking
- Contractions are short or may last several minutes

Labour contractions:

- Frequency and activitieswill not stop or slow it down
- Will be in predictable pattern of every eight minutes or every 5-10 minutes some women
- Will becomes frequate
- Last longer than usual
- Become stronger the woman is walking
- Build up, have a peak. then reduce

Labour and backache: Aching or backache is, like the heavy feeling during menses. Before labour commence, a plug of mucus that cover the cervical canal, made up of sticky, jelly-like pink mucus is discharged, this is known as SHOW and it marks the beginning of labour which may follow quickly, or it may take a few days in a pregnant woman. Some women do not have a show at all others may lose their show when their waters break.

Repturing of the membrances?Repturing of the membrances in a pregnant woman can occur during labour, or before labour starts. Themembrances protects the fetus as it develops and grows

inside a bag of fluid called the amniotic sac. The membrane is reputred when the baby is term and labour starts. In some cases there may be a feeling of a slow trickle, or a sudden gush of water that cannot be controled a sanitary towel could be used to protect the sheet on the bed. Amniotic fluid is clear and a pale straw colour. Sometimes it's difficult to tell amniotic fluid from urine. If it is blood-stained, smelly or coloured inform the midwife immediately, as this could mean that the mother and the baby require urgent attention. If the membrances repturedbefore labour starts, go to the hospital to see the midwife in charge. There is need for emergency care as the baby is no longer protected and there is a high risk of infection.

Signs indicating reptured membranes in a pregnant woman:

Cannot control flow of the fluid

Fluid cannot be absorbed by one liner only

A lot of pad will be used for the fluid

It doesn't smell like urine

Spontenous shivering: In early labourthere may be shivering or tremblingeven when the woman is not cold. It is a frightening conditionthat can happen during or after birth. It is a way the body uses to relief, tension and it lasts for few minutes. Help the woman relax, by bathing or cleaning her with warm water, massage, deep breathing can be used. Holding breath to the count of 5 several times consecutively can stop the shivers. Another trick is to count backwards in threes from 30. E.g. 30, 27, 24, 21…..

Lightening: Baby dropping and settleing deeper into the pelvis, now breathingis easier than before for the pregnant woman, because the pressure on the diaphragmis relieved. More pressure is felt on the bladder, which means more tripe to the bathroom.Most women go into labour withoutexperience lightening at all. If the baby did not drop it does not mean that labour cannot be established in a pregnant woman or that the baby will not fit. Strong, frequent contractions will help with that.

Diarrhea: Production of prostaglandin will stimulate the bowels to open more frequently a day before birth. This is in preparation for the birth of of the baby.Anxiety in labour can slow or stall contraction, however there can be some passing of stools during labour.

Report to the PHC Immediately if:

There is bleeding, reptured membrane and with green, brown, yellow or anything other than clear or pink fluid, Baby is not moving, continuous vomiting, unbearable pain, trying to push.

Copeing with labour:

- Walk/move arrond.
- Frequently drink isotonic fluids to help keep the energy levels up.
- Intake of snack, though some women feel sick during labour.
- Relaxation and breathing exercises especially when contractions get stronger and more painful.
- The woman's husband can rub her back as it can help relieve pain.

Delivery services: Tender care during labour e.g. words of encouragement, mutual respect, rubbing of the back , Free delivery pack

- Bath of mother and baby
- Observation of mother and baby for few days
- Assisting in activities of daily living including feeding

Changes during post-partum: Women may bleed for six weeks, It will eventually go from red to brown, and then pink and creamy yellow the last week. The discharge, is known as lochia. If you're saturating more than a pad an hour or if the discharge has a foul odor, report to the health provider. Focus on a healthy, balanced diet like high protein, moderate carbohydrate, and low fat, and get permission before starting a postpartum exercise program. The uterus returns to normal in six weeks, but your belly may never be as flat as it was. Incontinence is a common side effect of childbirth. to tighten those muscles with Kegels, which can be started almost immediately. The breasts will produce milkeven if the woman is not breastfeeding. As milk comes in, they may feel swollen, tight, and sore. Wear a snug bra, even at night, and relieve the pain with ibuprofen or ice packs. Milk production reaches its peak at three to four days. By day five, the pain and swelling should be easing. Your breasts should be back to normal size in a week to 10 days. Thinning hair, also known as telogen effluvium, is one of the most common complaints heard. The hair is "resting" after being in an active growth phase and will resume its

active growth in a few months. It's rarely severe enough to cause bald spots. Bout with acne shortly after giving birth is common, This is caused by fluctuating hormones which will clear with time, also there will bestretch marks.

Hemorrhoids will clear up on their own as the rectal area recovers. In the meantime, ease discomfort by soaking in a tub of plain, warm water; applying ice packs to relieve swelling; avoid sitting for long periods; applying cotton pads soaked in witch hazel to anal area; using white toilet paper or pre-moistened wipes; using an OTC remedy; eating plenty of fiber-rich foods; and drinking lots of water

Mood swings are common after childbirth. "baby blues" generally start on day three and last until day 14. They tend to be fairly mild, just an occasional bout of not being able to get a handle on your emotions. Anything more serious—or that lasts longer than 14 days—should be treated as a possibly serious issue. You may be suffering from postpartum depression. Most people wait for six-week checkup to resume intercourse, this depend on you.Periods will resume in four to six weeks and it often overlaps lochia," he says. Because of this, birth controlshould be discussed with a health provider.

Contraceptive methods

Current procedures

Method	Description	Actions	Effectiveness in preventing pregnancy	Comments
Oral contraceptives e.g combined type (COCs) or the pill	Contains two hormones (estrogen and progestogen)	Pevents ovulation	>99% effective with correct and consistent use 92% as commonly used	Endometrial and ovarian cancer risk is reduces; should not be taken while breastfeeding
Progestogen-only pills (POPs) or "the minipill"	Contains only progestogen hormone, not	Thickens cervical mucous to block prevents	99% with correct and consistent use	Used while breastfeeding; must be taken at the same

Method	Description	Actions	Effectiveness in preventing pregnancy	Comments
	estrogen	ovulation and fertilization	90–97% as commonly used	time each day
Implants	Small, flexible rods or capsules placed under the skin of the upper arm; contains progestogen hormone only	Same mechanism as POPs	>99%	Health-care provider must insert and remove; can be used for 3–5 years depending on implant; irregular vaginal bleeding common but not harmful
Progestogen only injectables	Injected into the muscle every 2 or 3 months, depending on product	Same mechanism as POPs	>99% with correct and consistent use 97% as commonly used	Delayed return to fertility (1–4 months) after use; irregular vaginal bleeding common, but not harmful
Monthly injectables or combined injectable contraceptives (CIC)	Injected monthly into the muscle, contains estrogen and progestogen	Same mechanism as COCs	>99% with correct and consistent use 97% as commonly used	Irregular vaginal bleeding common, but not harmful
Intrauterine device (IUD): copper	Small flexible plastic device containing copper sleeves or	Copper component damages sperm	>99%	Longer and heavier periods during first months of use are

Method	Description	Actions	Effectiveness in preventing pregnancy	Comments
containing	wire that is inserted into the uterus	and prevents it from meeting the egg		common but not harmful; can also be used as emergency contraception
Intrauterine device (IUD) levonorgestrel	A T-shaped plastic device inserted into the uterus that steadily releases small amounts of levonorgestrel each day	Suppresses the growth of the lining of uterus (endometrium)	>99%	Reduces menstrual cramps and symptoms of endometriosis; amenorrhea (no menstrual bleeding) in a group of users
Male condoms	Sheaths or coverings that fit over a man's erect penis	Forms a barrier to prevent sperm and egg from meeting	98% with correct and consistent use 85% as commonly used	Also protects against sexually transmitted infections, including HIV
Female condoms	Sheaths, or linings, that fit loosely inside a woman's vagina, made of thin, transparent, soft plastic film	Forms a barrier to prevent sperm and egg from meeting	90% with correct and consistent use 79% as commonly used	Also protects against sexually transmitted infections, including HIV
Male sterilization (vasectomy)	Permanent contraception to block or cut the vas deferens tubes that carry sperm from the testicles	Keeps sperm out of ejaculated semen	>99% after 3 months semen evaluation 97–98% with no semen evaluation	3 months delay in taking effect while stored sperm is still present; does not affect male sexual performance; voluntary and informed choice is

Method	Description	Actions	Effectiveness in preventing pregnancy	Comments
				essential
Female sterilization (tubal ligation)	Permanent contraception to block or cut the fallopian tubes	Eggs are blocked from meeting sperm	>99%	Voluntary and informed choice is essential
Lactational amenorrhea method (LAM)	Temporary contraception for new mothers whose monthly bleeding has not returned; requires exclusive breastfeeding day and night of an infant less than 6 months old	Prevents the release of eggs from the ovaries (ovulation)	99% with correct and consistent use 98% as commonly used	A temporary family planning method based on the natural effect of breastfeeding on fertility
Emergency contraception (levonorgestrel 1.5 mg)	Progestogen-only pills taken to prevent Pregnancy up to 5 days after unprotected sex	Prevents ovulation	Reduces risk of pregnancy by 60–90%	Does not disrupt an already existing pregnancy

Traditional methods

Procedures	Description	How it works	Effectiveness to prevent pregnancy	Comments
Withdrawal (coitus interruptus)	Man ejaculates outside partner's vagina,	Tries to keep sperm out of the woman's body, preventing fertilization	96% with correct and consistent use 73% as commonly used	One of the least effective methods, because proper timing of withdrawal is often difficult to determine
Fertility awareness methods (natural family planning or periodic abstinence)	Calendar-based methods: monitoring fertile days in menstrual cycle; symptom-based methods: monitoring cervical mucus and body temperature	The couple prevents pregnancy by avoiding unprotected vaginal sex during most fertile days, usually by abstaining or by using condoms	95-97% with correct and consistent use 75% as commonly used	Can be used to identify fertile days by both women who want to become pregnant and women who want to avoid pregnancy. Correct, consistent use requires partner cooperation.

Immunisation

Babies inherit specific antibodies from their mothers. These antibodies protect them aganist different diseases because they are vulnerable.Vaccinepreventable diseases cause 22% of child deaths in Nigeria, which is over 200,000 deaths per year. Vaccinations of babies in Nigerian are free, yet parents do not realise the importance of taking their children for immunisation. The PHCs are used for immunisations in Nigeria. On immunisation days, a card is given that will help health practitioners and parents to keep track of the vaccines the baby has taken and will take. The schedule for immunisation is as follows

Age of baby	Types of vaccine
At Birth	BCG, OPV1, HEPBO
6 weeks	OPV1, Pentavalent 1, PCV (optional), Rotaviru1(optional)
10 weeks	OPV2, Pentavalent 2, PCV (optional)
14 weeks	OPV3, Pentavalent 3, PCV, Rotavirus 2 (optional)
9 months	Measles
12 months	Yellow fever
15-18 months	MMR, OPV, chicken pox (optional)
24 months	Meningitis, Typhoid fever (optional)

Evaluation

- What are the changes that take place during labour?
- What are the changes that take place during post-partum?
- What are the signs and symptoms of the complications you can have during post-partum?
- What are the normal signs you will see during post-partum?
- How many types of family planning methods do you know?

CLOSING AND GOODBYE: Finally, congratulate the mothers, thank them for their participation, their patience, and their time, and inform them to participate in filling the post-test questionnaire during pot partum.

APPENDIX IV

FOCUS GROUP DISCUSSION GUIDE

Dear participate,

You are being invited to participate in this discussion being organised by a research student from Department of Nursing, University of Ibadan. The research is on outcome of reminder cslls and home visits on ANC adherenceand utilisation of delivery services in PHCs in Lagos state, Nigeria.

It is important that we discuss about these issues, so that we know what you feel about the situation and be able to know how to tackle identified problems. All information given will be used for the purpose of finding solutions. It will not be used against anybody. Your participation is voluntary. Feel free to give your honest answer to questions.

The group discussion will be audio taped so that the researcher will be able to analyze the recorded information. Your permission is needed before the commencement of the discussion.

SECTION A: Demographic Date

1, Participant's No:……

2. Name of PHC:……

3. Age at last birthday: ……..

4. MaritalStatus:……

5. Occupation:……

6. EducationalAttainment: …….

7. State of origin:……

8. Religion:……

9. Parity: ……..

SECTION B:

10. What do you know about ANC at PHCs?

11. What do you know about delivery services at PHCs?

12. When should a pregnant woman book for ANC at the PHC?

13. A pregnant woman should attend ANC at the PHCs how many times?

14. A pregnant woman cannot attend ANC at PHCsbecause of some barriers? list them?

15. What are the barriers that make a pregnant woman not to use delivery services at PHCs?

16. What are the benefits that will make a pregnant woman attend ANC at PHCs?

17. What are the benefits that will make a pregnant woman use delivery services at PHCs?

18. What are your suggestions that will make pregnant women to use ANC at PHCs?

19. What are your suggestions that will make pregnant women to use delivery services in PHCs?

20. What are the benefits of reminder calls and home visits on adherence to ANC in PHCs?

21. What are the benefits of reminder calls and home visits on utilization of delivery service in PHCs?