# FACTORS ASSOCIATED WITH HEMATINICS UTILIZATION DURING PREGNANCY AMONG MOTHERS OF UNDER TWO YEARS IN IBADAN NORTH-EAST LOCAL GOVERNMENT AREA, OYO STATE

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**A PROJECT REPORT SUBMITTED TO**
**THE DEPARTMENT OF HEALTH PROMOTION AND EDUCATION,**
**FACULTY OF PUBLIC HEALTH, COLLEGE OF MEDICINE,**
**UNIVERSITY OF IBADAN**
**IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF**
**MASTER OF PUBLIC HEALTH (HEALTH PROMOTION AND EDUCATION)**
**OF THE**
**UNIVERSITY OF IBADAN**

**FEBRUARY, 2021**

# CERTIFICATION

This is to certify that this project was being carried out by OKUNROTIFA OMOLARA SERAH (211351) and supervised by DR. TITILOYE MUSIBAU of the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan, February 2020.

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## DEDICATION

This project work is dedicated to God Almighty for His many mercies, and to the mothers of under-two in Ibadan North East LGA.

# ACKNOWLEDGEMENTS

My profound appreciation goes to Dr. M.A Titiloye, for his excellent supervision, understanding and fatherly nudging towards success throughout the duration of the research work, as well as for his beautiful addition to my knowledge as a student under his tutelage in the courses that he took us. I am indeed indebted for your words of encouragement, thank you sir..

I thank Professor O.Oladepo for his encouragement to research, and his support during the course of the programme, which have helped me become better as an individual, a researcher and as a student. I am very much grateful to Dr. Yetunde John-Akinola, Dr.Adeyimika T.Desmenu, Dr. Mojisola M. Oluwasanu for always inquiring about the progress of my work, and to the entire Teaching and Non teaching staff of the Department, I say God bless you all.

To my wonderful friend, partner, and future, Mr. Owojuyigbe Michael, thank you for your care, support, prayers, strength, love and all…I know I cannot repay you for all you have done. Thank you.

To my beautiful angel and also the king of my heart, Michelle Oluwafikayomi Owojuyigbe and Richard Olunifesi Owojuyigbe. Thank you two for the uncommon understanding and calmness whenever mummy needs it. Mummy loves you. To Pastor and Pastor (Mrs) J.O Owojuyigbe, my Daddy and Mummy who have in love and law added me to their family, thank you for your love, and support. To my siblings for your prayers, calls and support all through,  I say a big thank to you all. To my sister-in-crime, Temiloluwa  I say thank you ma'am. I love you all, and God bless you.

I am especially indebted to my parents, Elder and Deaconess J.O. Okunrotifa for their support (financial & moral), encouragement, prayers, and love throughout the course of my pursuit of the Golden Fleece.

To my wonderful people at Agugu and Atipe community, thank you for responding to all my questions, it's a success.

To all my colleagues, thanks for making my academic pursuit a fun one. See you all at the top

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# Glossary of Abbreviations

**ANC**     Antenatal Care

**MNCH**   Maternal and neonatal child Health

**LBW**      Low Birth Weight

**PCV**      Packed Cells Volume

# Definition of Terms

**Adherence**: The act or condition of sticking to dose and time for taking iron/folate supplements as per recommendations.

**Anemia:** A condition where the hemoglobin (Hb) level in the body is less than 11g/dl which depicts decreased oxygen-carrying capacity for pregnant women.

**Antenatal Care Clinic (ANC):** A section in the hospital where a pregnant woman receives regular check-ups, nutritional supplements (iron/folate) and medical and nutritional information throughout her pregnancy.

**Hematinics :** Chemical agents that improve the quality of blood, increase haemoglobin level and the number of erythrocytes. These include; Iron (Fe), Folic acid, Vitamin B12, Zinc (Zn) and Cobalt (Co).

**Iron deficiency (ID):** A situation in which iron levels in the body is less than 3g in the whole body.

**Multigravidae**: A woman who is or has been pregnant for at least a second time.

# Abstract

Anaemia is said to be among the leading causes of maternal mortality among pregnant women in Nigeria, and is brought about by deficiencies of Iron and Folic acid. Compelling evidence abound showing the effectiveness of hematinics on hemoglobin levels during pregnancy, yet, considerable evidence abound detailing minimal utilization rates across the country. However, whilst much attention has been paid to utilization rates of hematinics and the diverse consequences among which anaemia is chief, little such has been paid to the contexts affecting the demand for, and utilization of such supplements. This study therefore examined these contexts by assessing the knowledge levels of, factors influencing, perceptions of, and willingness of mothers of under-two year old children about hematinics in Ibadan North East Local Government Area, Oyo state.

Ajzen's Theory of Planned Behaviour was adopted as a theoretical reference point. A Survey research design was used, with an interviewer-administered structured questionnaire used in collecting data. Ethical approval was sought from the Oyo State Ethics Review Committee, and informed consent was obtained from all 190 respondents sampled purposively within this study. Data generated was analyzed with the aid of SPSS version 24 and descriptive as well as inferential statistics were drawn from the dataset.

The mean age of respondents was 28.7, with 44.7% of the respondents aged between 26 and 30 years. The Yoruba ethnic group represented 90.4% of the sample, with 53.2% being Muslims and 88.5% of the sample size being self-employed. Forty-one percent of the sample also had secondary school leaving certificate as their highest educational achievement, while 67.9% had utilized formal health care facilities for childbirth and health treatment. Eighty-four percent claimed to know about hematinics and 71.6% claimed to have obtained this knowledge from clinics. However, the research found that the knowledge score of respondents was 4.9 ±1.7. Poor family support (65.3%) and inability to make decisions at home (59.5%) ranked highest among the factors affecting utilization of hematinics, and while 68.9% of respondents had positive opinions about hematinics, 52.6% respondents opined that it was unnecessary to purchase. In total, only 48.9% showed a willingness to use hematinics in subsequent pregnancies. None of the socio-demographic characteristics cross-tabulated showed any significance association with knowledge; while distance to supply (0.002), cultural factors

(0.044), cost of drugs (0.003), poor family support (0.02), and inability to make decisions at home (0.025) had significant association with use of hematinics; and adherence to use was significantly associated with education (0.009).

While the importance of hematinics is without doubt, this research showed that knowledge levels and adherence rates to hematinics utilization was quite low among mothers of under-two in using hematinics during their pregnancy phase in Ibadan North East Local Government Area, Oyo state. This research made suggestions regarding continued public sensitization on the subject based on the research objectives and the findings drawn from the data gathered.

Key words: Anaemia, Hematinics, Pregnancy, Maternal Mortality, Iron/Folate Deficiency

**Word count: 472**

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background to the study

Afkhami-Ardekani and Rashidi (2009) defined hematinics aschemicalagents that improve the quality of blood, increase haemoglobin level and the number of erythrocytes. These include; Iron (Fe), Folic acid, Vitamin B12, Zinc (Zn) and Cobalt (Co). Deficiency of these essential hematinics arising from increased requirements and inadequate intake may have far reaching effects on both mother and the foetus. Iron for one, is the main component of haemoglobin, and its deficiency is the most common cause of anaemia in pregnancy (Afkhami-Ardekani and Rashidi, 2009).Hambali, Kodomi, Nelson et al (2016)explains that the physiological anaemia which accompanies pregnancy is often exacerbated by deficiencies of iron or folic acid. Fetuses are plagued as a consequence by several problems during pregnancy which include: preterm birth, restricted fetal growth, as well as other factors affecting the fetus's development such as congenital infections and fetal alcohol syndrome (Manithip, Sihavong,Wahlström and Wessel, 2011). However as highlighted by Hambali et.al (2016), when the diet of pregnant women is supplemented by these hematinics, the increase in the red cell mass is doubled, thus reducing the likelihood of anaemia and by consequence, maternal mortality or infant congenital anomalies.

Anaemia is especially reported to be a major cause of maternal mortality in these 'developing countries', including Nigeria and has been argued to be responsible, for roughly between 20-30% of all cases of maternal mortality (Hambali, et.al, 2016). Idowu, Mafiana, and Dopu (2005) note that about 60% of pregnant women in Nigeria, as well as other developing nations, are Folic acid anaemic, while approximately 7% of pregnant women are extremely anaemic. Hambali et.al, (2016) also in a study conducted among pregnant women seeking antenatal care in Oyo State, the level of anemia prevalence was discovered to be as high as 58%, a worrying rise since previously the prevalence of anaemia in the state had using WHO criterion range been determined to be at 51.4% (Aimakhu and Olayemi, 2003; Ogu and Ikimalo, 2018). In Enugu, Southeast Nigeria, Ugwu, Olibe, Obi, Ugwu (2014) also surmised that the prevalence level of anemia in pregnancy among attendees of antenatal clinic was particularly high.

, around 800 women die from pregnancy or childbirth-related complications every day, many of which are preventable if women have access to provision of hematinic drugs, an adequate antenatal care (ANC) delivery system, as well as skilled obstetric assistance during delivery antenatal care in pregnancy, skilled care during childbirth, and care and support in the weeks after childbirth (WHO, 2014a).In fact, the ANC system provides pregnant women with information, whilst ensuring that they are screened and treated for anyand all medical conditions or risk factors that may affect their health or the baby's.Moreso, studies even by African scholars and with African subjects (Awusi, Anyanwu, and Okeleke, 2009; Mbada, Adebayo, Adeyemi et.al, 2014) have shown that safe maternity and reduced risks of maternal mortality with improved chances of neonatal outcomes is predicated on receiving adequate and proper focused antenatal care services, of which hematinics provided during attendance of such services is key.

Moore, Alex-Hart, and George (2011) also examined the utilization of health care services by pregnant mothers, and posited that poor utilization of all aspects of health services including hematinics by many pregnant women is a major cause of maternal morbidity and mortality in Nigeria. Despite all the highlighted positives of ANC utilization, numerous studies have noted that a good number of women for various reasons do not access the ANC services, and as such often do not have knowledge of, access to, or use hematinics. Some of these reasons are largely problems on the supplyside, that is with providers such as the unavailability of staff or medical equipment, while others are on the demand side, that is, problems with those seeking health care services. Bakeera, Wamala, Galea, State, Peterson and Pariyo (2009) argued that the barriers to healthcare utilization are existent along three different axes which are the process of seeking health; the process of health service delivery; as well as the ownership of livelihood assets.

Mubyazi (2015) noted the complex nature of the association between the indices of health seeking behaviour and health care service utilization, with evidence from literature demonstrating the influence of various factors on health service and product utilization among pregnant women in different communities. For instance, literature reviewed by Mubyazi (2015) reveal that there is a non-utilization of health care facilities for the purpose of delivery prompted by indices such as the distance to the health facility, late onset of labour, unavailability of or lack of funds for the required means of transportation, unsatisfactory services as well as the unfriendly and sometimes unavailable health facility staff among others. Buor (2002) adds that

on a general basis, the key issues that influence utilization of maternal facilities are the health care seeker's level of education, perceived distance to health facility and the service cost. Poverty for instance is noted to be a major health and health-seeking determinant as poor pregnant women are often financially unable to pay for the required health care services, including purchase of hematinic drugs where they are not freely and readily available, and as such run the risk of developing high-risk pregnancy related complications (UNFPA, 2006; Ibor, Anjorin, Ita, Out and Bassey, 2011).

A study by Iyaniwura and Yussuf (2009) on the utilization of ANC services and products in Sagamu, South Western Nigeria showed that while perceived quality of service informed choice, both education and especially, the income of women of childbearing age positively influenced the general pattern of utilization of these services and products. Mubyazi (2015) argued that these can be grouped into socioeconomic factors, geographic barriers and quality of services among others. Others in this case are noted in studies (Chakraborthy, Islam, Chowdhury, Bari,and Akhter 2003; Haussman-Muela, Ribera and Nyamongo 2003) as including the knowledge, beliefs and attitudes in relation to disease and health services are among the key determinants of health service and product utilization.

However, while health facility statistics are on the rise among pregnant women (Mbada, Adebayo and Adeyemi et.al, 2014), this is yet to fully stem the tide of maternal mortality and morbidity as more often than not knowledge about, beliefs of and attitudes towards do not allow for health facility attendance to translate into utilization of health care products and interventions. Abdulkadir and Ajay (2015) observed this when they noted that one major issue affecting the use of interventions, in general, and drugs as well as vaccinesspecifically is the (un)willingness of the population to accept and use such interventions.

In fact, as Hambali et.al (2016) noted, in the case of anaemia in pregnancy, the major problem is compliance with hematinic usage and instructions, and this is highlighted as a potential driver for the high prevalence rate of anemia among the population of developing nations. This is especially important giving that Akpan, Agan, Monjok, Okpara, and Etuk (2017) note that routine iron and folic acid supplements have been proven to be effective in pregnancy to help in reducing both the prevalence and the morbidities associated with anaemia. Katahoire, Jitta,

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Kivumbi, Murokora et al (2008)posited that unwillingness to accept and use such drugs is as a result of misinformationor poorly handledinformation, as drugs especially routine drugs play a crucial role in promoting the health and wellbeing of both mother and fetus.

The National Collaborating Center for Women and Children (2008) noted that medical and nursing experts specializing in antenatal care (ANC), suggest that pregnant women should be properly informed about services and products as well as the full implications of all alternative courses of action so as to enable them take appropriate care-related actions. The center concludes that right ANC seeking and service use decisions cannot be made if clients lack the needed information at the right time and in a comprehensible manner.Kallen (2005) as well as Savitha, Sarita and Kashinath et.al (2016)noted that although the safety of prescribed drugs during pregnancy has become a major concern since the thalidomide tragedy of the 1960s, the use of certain drugs at the same time is a prerequisite for maternal and fetal health (Selvaraj, Sekar, Ghandi et.al, 2018).

Mary and Terry (2003) however reported that inadequate intake of Hematinics during pregnancy will result in an increased level of erythropoietic drive on the bone marrow, thereby if a large number of women do not have good knowledge about importance of hematinic supplemental ion this may lead to poor health-seeking actions with negative birth outcomes.  Mubyazi (2010) also found that many social science theorists as well as those in the humanities discovered that knowledge and perceptions about health issues may differ, that is, one's perceptions may sometimes be influenced by the knowledge that one has about such an issue, and as such the association between both elements may have huge implications for the individual's health seeking behaviour.

Although Hausmann-Muela et al. (2003) posits that a person may have knowledge and may not always be translated into practice, besides knowledge alone on its own considering the impact of significant other personal factors and societal beliefs may not alone be able to influence people's health seeking behaviours, however, it can be stated that knowledge enables individuals to recognize and properly exercise their health rights (Maputle et al., 2013). There is thus a need to exploreboth the knowledge levels and the perceptions affecting consumption of

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hematicsamong women who have only recently been ANC clients includingthe factors relating to their utilization and their willingness to use hematics.

## 1.2    Statement of the Problem

Considering the importance of hematinic intake and comparing it with the outcome of non-utilization by pregnant women actually triggered this research.Despite the assumption that iron supplementation is an integral part of Antenatal Care (ANC), very few women who had ANC in Oyo stateuses iron supplements (Hambali et al 2014).  Several studies (Iyaniwura and Yussuf, 2009; Moore et al., 2011; Mbada et.al, 2014; Mubyazi,2015) have focused on the patterns of health facility and product utilization amongst pregnant women.However, these studies have often neglected attitudinal determinants of health facility utilization such as their perceptions of service products or their willingness to utilize suchproducts.This leaves a huge gap in the literature. There is therefore the need to assess the various factors that could affect and also influence the utilization of hematinics during pregnancy among mothers of under two years in Ibadan North-East LGA Oyo state.

However, whilst sources such as Wagstaff (2002) posited about the centrality of health inequality reduction to development of programmes, and the need for the availability of services, organizationsand as well as financial capacity of such services,the issue of knowledge about these health service products should feature more prominently in literature. As such, the levels of knowledge of the importance of hematinics drugs among users of the ANC services is noted as an area that has been seldom explored in literature. Highlighting the level of knowledge is especially crucial as the lack of proper knowledge may lead tohealth-seeking actions with negative health consequences arising from poor information or misinformationabout routine hematinics drugs (Katahoire et al, 2008). Mubyazi et al (2008) and Mubyazi (2015) are in consonance with this view and noted that the absence of correct and/or adequate knowledge about a particular health service may prompt the developmentof wrong perceptions about such services, which may lead to non-utilization of ANC services in several communities, as has also been proven that malaria-related services delivered in ANC clinicsand, have contributed to limiting the utilization of such services in certain communities.

In addition, literature (WHO, 2005; Awusi, Anyanwu, and Okeleke, 2009) has focused so much on the use of the health facility, but not so much on the health care products or interventions that are gotten from the facility such as drugs and injections, erstwhile, where there have been research studies on drug use during pregnancysuch as, (Kallen, 2005; Savitha, Sarita and Kashinath et.al, 2016; Selvaraj, Sekar, Ghandi et.al, 2018) has laid emphasis also not on routine hematinics drugs, but on prescription drugs in general, and the patterns of prescription among health practitioners more than patterns of consumption amongst those women who utilize ANC services.

Hambali, et.al, (2016) who worked on the factors leading up to non-compliance to haematinics among pregnant ante-natal clinic users in University of Maiduguri Teaching Hospital, noted the effect of certain socio-demographic variables such as higher educational qualification on haematinics use among respondents, as well as certain properties of haematinic drugs such as the duration of usage. However, despite the fact that anemia in pregnancy is deemed as prevalent as well as being a major cause of maternal mortality, and that low socioeconomic status was significantly associated with higher prevalence rates of anaemia, not much is known about how the socio-demographic characteristics, willingness/perception, or beliefs of pregnant women may affect utilization.

From the fore-going,As one of the study limitations mentioned by Hambali, et.al, (2016)it can be deduced that literature on the subject is lacking in areas such as attitudinal and socio-demographic determinants of haematinic utilization such as their perceptions of hematinics or their willingness to utilize these drugs. Knowledge of the importance of routine drugs among users of the ANC services,and also the patterns of utilization of routine hematinics drugs amongst women utilizing ANC services should also be delved into.

## 1.3    Justification forthe Study

This study seeks to identify theknowledge levels,determinant factors, perceptions andwillingness to utilise in relation to hematinic use anddesign mechanisms that will promote the goal of reducing maternal and neonatal morbidity and mortality (Maputle et al., 2013), especially considering the fact that Oyo State for instance has an anemia prevalence of 58 percent among pregnant women (Hambali, Kodomi, Nelson et.al, 2016).In addition, in the area of maternal and

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Neonatal child health (MNCH), the need to both understand patterns of utilization and the importance of knowledge of routine drug use among targeted ANC clients will provide data which will help drive forward further research on ANC service delivery and routine drug administration among clients. Whilst doing these, it will also provide information on client willingness, and reasons for unwillingness where there may be such issue, as well as which gate-keepers may be able to help resolve such issues.

Furthermore, this study will further add value to the field of Health Promotion and Education, and Public Health in general as well as Obstetrics and Gynecology among others at a theoretical as well as a methodological level. Also, the insights gained from this study will contribute to literature on the provision of ANC services. In particular, it will illuminate the experiences of mothers of under-five children with regards to routine drug use as well as provide answers to what issues, and experiences shaped their use of routine ANC drugs. Also,the research will generate possible factors that can influence or affect the use of hematinics. This study aimed at contributing towards the improvement of compliance and adherence to hematinics supplementation in order to mitigate anemia and other reproductive health challenges of pregnant women.

## 1.4 Research Questions

Research questions raised from the research gaps highlighted in the fore-going are:

i.   What is the level of knowledge among mothers of under-two in Ibadan North East Local Government Area, Oyo state about hematinics?

ii.  What are the factors influencing the acceptance of taking hematinics among mothers of under-two in Ibadan North East Local Government Area, Oyo state?

iii. What is the perception of mothers of under two -years in Ibadan North East Local Government Area about hematinics?

iv.  What are the level of willingness of mothers of Under-two years in Ibadan North East Local Government towards the use of hematinics?

## 1.5 Research Objectives

The broad objective of this study is to assess the factors associated with the utilization of hematinics amongmothers of Under-two in Ibadan North East Local Government Area. More specifically, this research:

i. assesses the knowledge level of mothers of under-two in Ibadan North East Local Government Area, Oyo state about the use of hematinics.

ii. determines the factors influencing the choice of hematinics among mothers of under-two in Ibadan North East Local Government Area, Oyo state

iii. examines the perceptions of mothers of under-two in Ibadan North East Local Government Area, Oyo state about the use of hematinics.

iv. assesses the willingness of mothers of under-two in using hematinics during their pregnancy phase in Ibadan North East Local Government Area, Oyo state

## 1.6    Research Hypotheses

The following hypotheses will be checked within the study:

Ho1: There is no significant association between socio-demographic information and knowledge levels of mothers of under two

Ho2: There is no significant association between socio-demographic information and willingness of mothers of under two to utilize hematinics

Ho3: There is no significant association between socio-demographic characteristics and utilization factors among mothers of under two

# CHAPTER TWO

# LITERATURE REVIEW

A review of Hematinics utilization during pregnancywould not be complete without a proper introduction into pregnancy and need for hematinics, silent causes of reproductive and newborn health challenges, the delineation between routine drugs and other drugs, why this study is required, and an exploration of the factors that affect pregnant women's decisions to utilize antenatal care services and products. The review sets out with a basic description of antenatal care,supply side and demand side challenges, and also captures a comparative narrative of antenatal care across different countries, the issues that they have, and utilization rates.

According to the World Health Organization (2015), developing regions accounted for approximately 99% (302,000) of the global burden of maternal deaths in the year 2015 alone; with the risk of maternal mortality during pregnancies being 1 in every 48 deliveries due to a problem of unavailability of quality health care services (Iyaniwura and Yussuf, 2009). Africa as shown in literature has the highest burden of maternal mortality in the world; and the Sub-Saharan African region is especially responsible for the huge maternal death rates coming out of the region, in fact contributing about 66% (201,000) of the maternal deaths for the region (Babalola and Fatusi, 2009; Azuh, Azuh and Iweala, 2017).

Nigeria, a major player in the Sub-Saharan region, witnessing a decline of 27% in between the year 2005 (820 per 100,000 live births) and 2010 (630 per 100,000 live births), still contributes a huge chunk to this burden and is ranked amongst the top 13nations of the world in terms of maternal mortality rate. In contrast, more developed nations are quickly witnessing a situation wherein maternal mortality is fast becoming a rarity due to the availability and accessibility to high quality health care services amongst pregnant women (Ewa, Lasisi, Maduka, Ita et.al, 2012).

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The literature will focus on the following thematic areas:

1. The Knowledge about Hematinics utilization
2. The perception of Hematinics among women
3. Pregnancy and Need for Iron and Folate
4. Underlying causes of reproductive and newborn health problems
5. Consequences of iron deficiency and folate in pregnancy
6. Accessibility and use of maternal and child health services
7. Supply side problems and the use of hematinics among Pregnant women
8. ANC Attendance and Utilization
9. Men's roles in decision makingon the use of hematinics

## 2.0     The Knowledge about Hematinics Utilization

Globally 41.8% of pregnant women are anemic. Low maternal risks perception, inadequate knowledge about the importance of hematinic utilization, poor dietary practices are major contributors of high burden anemia (Masreha L.Sebesa, and Maleda  T, Iffa 2018).  The awareness level and attitude towards folic acid utilization, and other prevention practices of anemia have not been well established. In a study conducted by (Abdu Oumer 2018), it was deduced that very small proportion of pregnant women could identify the symptoms of anemia correctly as shortness of breath, majority of respondents knew how anemia could be prevented but only few admitted that anemia can be prevented by adequate utilization of hematinics.Thus it is very important to delve into the knowledge level about hematinics utilization in this study.

## 2.1     Pregnancy and Need For Iron And Folate

There is a significant increase in folate absorption by the body cells during pregnancy, this is due faster rate of cell division in the maternal and fetal tissues, and also more deposition of iron in thefetus (Lynette,2013).Randomized, controlled trialshave shown that taking hematinics especially folic acid supplements before conception and through about the first four weeks of pregnancy lowers the risk of genetically predisposed women having a baby with a neural tube defect (Scholl and Johnson, 2000). In China, the occurrence of neural tube defects was greatly

reduced up to 80% by a supplement providing only 400μg/d of folic acid. Taking a daily supplement of 400μg folic acid reduced the risk by 70% in New England (Lynette, 2013).

It is important to note that as pregnancy develops, the body cells would needan additional 6mg/d of iron, because (300mg) of Iron is retained by the fetus, (60mg) deposited in the placenta and (450mg) would be used for synthesis of additional maternal red blood cells. More so, blood loss during delivery and mother's retention in the increased red cell mass parturition accounts for 200mg respectively (Lynette, 2013; Barry et al 1994). Iron absorption by the body cells increases greatly during second and third trimester (Lynette, 2013; Barret et al,1994). The current recommendation is for pregnant women to take an additional 30mg of iron daily during pregnancy, starting around 12th week. Because this amount of iron cannot be readily obtained from food, it is recommended that iron supplements should be taken between meals, and without coffee or tea which can impair iron absorption (Lynette, 2013;Institute of Medicine, 1998).Thus it is very important to use hematinics before and during pregnancy.

## 2.2    Underlying Causes of Reproductive and Newborn Health Problems

Reproductive health, ideally, means that every baby is wanted and planned for and that every pregnant woman has access to the resources she needs for her own and her baby's robustness. It means putting more effort into improving the survival, health, and development of infants.It also means helping to solve problems of infertility for men and women who want to have a baby and cannot, It means finding more acceptable, safer contraceptive methods and making existing methods more available, with vigorous dissemination of information about contraception and other health matters that affect reproduction. It means increasing support to eliminate or alleviate genetic diseases. Most important, it means developing the view that healthy reproduction is intrinsic to the vitality of the nation and, with it, the commitment to use all possible means, including education, research, ethical inquiry, and political action, to achieve that goal.

The World Health Organization (WHO) defines anaemia in pregnancy as a hemoglobin concentration less than 11g/ dl and estimates that more than half of pregnant women in the world have a hemoglobin level indicative of anemia (WHO, 2015; Ogu and Ikimalo, 2018). Coupled with obstetric haemorrhage, anemia is estimated to be responsible for 17% to 46% of causes of maternal deaths (Stevens, Finucane, De-Regil, Paciorek et.al, 2013). Anaemia as also defined by(Nwizu, Iliyasuand Galadanci 2011) asthe decrease in the concentration of circulating red

blood cells or in the haemoglobin concentration and con-comitant impaired capacity to transport oxygen, has been cited by WHO as one of the underlying causes of newborn health problems. The World Health Organization (WHO) further dividesanaemia in pregnancy into mild anaemia (haemoglobin 10 –10.9g/dL), moderate anaemia (Hb 7.0-9.0g/dL) and severeanaemia (haemoglobin <7g/dl or 10.5 g/dl).With reference to WHO, (2008),in tropics a pregnant woman is said to beanaemic when haemoglobin is less than 10g/dl or PCV is<30%, it has also been estimated that the global prevalence ofanaemia in pregnancy is 42%. Anaemia in pregnancy isthought to be one of the commonest problems affectingpregnant women in developing countries. Among girls andwomen in the developing world, anaemia was ranked theeighth (8th) leading cause of death by the World Bank in 1993.By WHOs' criteria, over 2000 million people are anaemic. Salaudeen, Durowade, Durotoye, Sanni, Musa and Akande, 2019) suggested in their studythat being aneamic could affect fertility rate, and also that it can sometimes affectbirth outcomes.

Factors associated with anaemia in pregnancy are gestational age at booking, educational status, marital status, socioeconomic class, parity, inter-pregnancy drugs as well as use of insecticide treated mosquito net (Muguleta, Zelalem, Meseret, & Banlaku, 2013) Newborn health problems indicates that most women with severe anaemia during have an increased risk of developing complications, particularly during and after birth. They may also develop postnatal depression (which some parents experience after having a baby). Studies suggests babies born to mothers who have untreated anaemia are more likely to be born prematurely (before the 37th week of pregnancy), have a low birth weight, have problemswith iron levels themselves, do less well in mental ability tests, increased risk of infection, heart and lungs problems, restless leg syndrome.

## 2.3    Consequences of Iron Deficiency and Folate In Pregnancy

Folate is very important for foetal development as well as being a cofactor essential in the nucleotide biosynthesis,a significant clinical manifestation of folate deficiency is macrocytic anaemia (Scholl and Johnson, 2000). Folic acid deficiency has been directly linked to neural tube defects without a doubt. A review studied 35 published studies and found in concordance with a Cochrane review (Lumley *et al*., 2000) that periconceptual folate supplementation reduced the incidence of neural tube defects by as much as 70%. The reduction is similar for occurring as

well recurring defects. Folate supplements reduced significantly the homocysteine concentrations. Homocysteine levels are also higher in women who have given birth to offspring with neural tube defects.

Many observational studies of folate during pregnancy suggest that there is a potential benefit of good folate status with improvement of birth weight and gestational age. However, randomized trials of folic acid supplementation have shown quantifiable benefits (Scholl and Johnson 2000, Lumley *et al*., 2000). Iron deficiency is the most common nutritional disorder in the world, affecting approximately 25% of the world's population (WHO, 2002). Pregnant women are particularly at high risk for iron deficiency and iron-deficiency anemia because of increased iron needs during pregnancy. The prevalence of iron-deficiency anemia in pregnant women is estimated to be an average of 56% in developing countries whereas in industrialized countries the average prevalence is 18% (WHO, 2002).

Folate deficiency increases homocysteine concentrations. Women with habitual abortions were found to have a higher prevalence of hyperhomocysteinemia as compared to controls (Wouters *et al*., 1993; Nelen *et al*., 1998), also confirmed by other studies (Scholl and Johnson, 2000). Hematinics (particularly Iron) lead to increase in serum erythropoietin level which decreases during pregnancy, Folic acid reduces the risk of birth defects in foetus how this is achieved is not known, complications such as folic acid anaemia, spinabifida, anencephaly and encephalocele occur when it is deficient during pregnancy. Vitamin B12 is a cyanocobalamin, plays a role in the synthesis of Deoxyribonucleic acid, Ribonucleic acid and hypoproteins by acting as a cofactor for enzymes(Abdulraheem, 2010.) Moreso,non-compliance to hematinic drugs among pregnant women is the major cause of anaemia during pregnancy especially in many developing countries in Africa, which is one of the major causes of maternal mortality in Nigeria(Villar, Ba'aqeel, Piaggio, Lumbiganon, Belizán and Farnot, 2002).

Anaemia in pregnancy continues to be a major health problem in most developing countries, with significant adverse effects for both mother and infant.10 Iron deficiency is the main underlying cause for anaemia in pregnancy followed by folate deficiency. Anaemia has previously been shown to be associated with adverse pregnancy outcomes. What has not been clearly demonstrated is the effect of treatment of anaemia in pregnancy with haematinics on pregnancy outcome.11 According to the most recent and available national data now more than

two decades old the prevalence of anemia among pregnant women in Nigeria is 67 percent, making it a severe public health problem as defined by WHO standards.

Many women in developing countries are often already iron deficient and/or anemic before they become pregnant, and thus hematinic supplementation has been considered a preventive strategy for all women of reproductive age. WHO has also recommended a 6-month regimen of a daily supplement containing 60mg of elemental iron along with 400µg of folic acid for all pregnant women. Supplementations has been recommended to continue for three months postpartum,in areas with a higher prevalence of anaemia, (WHO, 2001). Anemia during pregnancy has been shown to double the risk for preterm delivery and increase by three-fold the risk for low birth-weight as well as maternal mortality (WHO, 2001; Scholl *et al*., 1992). There are multiple causes of anemia during pregnancy, including inadequate diet (mostly inadequate iron supply` but also folate and vitamin B12 deficiencies), impaired micronutrient absorption, blood loss resulting from hemorrhage, and helminth infestation (Li *et al*., 1994). Non-nutritional causes include thalassemia, malaria and sickle cell disease. Repeated pregnancies, too, are a source of blood loss. It is generally estimated that half of the anemia cases in pregnancy are related to iron deficiency (Li *et al*., 1994). Iron-folate supplementation can be effective in correcting and preventing iron deficiency anaemia in pregnant women but effectiveness of the programme is limited by adherence of pregnant women to the iron-folate supplements (Scholl *et al*., 1992**).**

Though there is considerable evidence that treatment of Iron deficiency with supplements is effective in improving hemoglobin levels during pregnancy, intervention programs have not been very successful. Some of the major problems are linked to the distribution and utilization of iron supplements during pregnancy at the level of both the supplier and consumer of the iron/folate supplements (Ellis, 1998).

## 2.4    ANC Attendance and Utilization

Despite the assumption that iron supplementation is an integral part of Antenatal Care (ANC), only 37% ofwomen who had ANC, received iron supplements (WHO report 2003). ANC is defined as the care that is given to a pregnant woman and her unborn baby throughout the pregnancy. Antenatal care is the care provided to women from beginning of pregnancy to the onset of labour. (WHO/UNICEF, 2003).It offers the opportunity for health care providers to encourage health behaviours, monitor the women's physical and emotional condition during

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pregnancy, provide tetanus immunization, prepare for childbirth, and warn women, their families and communities of possible complications and the prompt attention if and when they arise (WHO/UNICEF, 2003).

Utilization of ANC services would increase the chances of women to quickly detect pregnancy related problems and seek medical care thereby reducing maternal mortality (Campbell & Gipson, 2001). The UNICEF's report (2008a) on tracking progress in maternal, newborn and child survival recognized that antenatal service utilization contributes to reducing maternal and infant mortality. Coverage with broader approaches such as ANC services is feasible for universal implementation in poor countries (UNICEF, 2008a).

Some importance utilization of ANC include, health education and counselling on pregnancy and emergency preparedness, prevention and treatment of anaemia, nutrition support, hygiene, birth plan, postpartum care, breast feeding, sexually-transmitted infection prevention and family planning (WHO/UNICEF, 2003). ANC is a key entry point for a pregnant woman to receive a broad range of health promotion and preventive health services including routinely checkup for Iron deficiency anaemia, antenatal examinations, intercurrent disease treatment, routine screening for syphilis, voluntary counselling and testing for *HN,* prevention of mother to child transmission of *HIV*, periodic de-worming,nutrition supplementation and tetanus immunizations (FMoH Nigeria, 2009).

Another advantage of attending ANC is the benefit of free insecticide-treated nets (ITNs) given out in government health facilities (Harrison, 2009).This care involves regular visits to the doctor or midwife, who performs abdominal examination, blood and urine tests, and monitors blood pressure and foetal growth to detect disease or potential problems **(**Kindersley, 2007).Antenatal care is one of the means to reduce maternal mortality and morbidity with interventions and information that promote the health, wellbeing and survival of mothers and their babies (UN 2012). ANC services offer the medical staff a chance to educate women regarding the danger signs in pregnancy and measures to be taken. It also creates an opportunity to discuss sensitive issues such as unwanted pregnancy or violence in homes thereby averting maternal deathassociated with unsafe abortions.

ANC services provide a platform for the health provider to promote the benefits of skilled attendance at birth and to encourage women to seek postpartum care. Women attending ANC at least four times during pregnancy are on average 3.3 times more likely than other women to give

birth with a skilled provider (WHO/UNICEF, 2003). Over half a million women suffer complications annually due to pregnancy and childbirth and many die. However, WHO contend that the immediate cause of maternal death is absence, inadequacy or underutilization of maternal and child health services (WHO, 2004). In addition, the World Bank (2006) states that high maternal mortality rates in many countries result from poor reproductive health care, including not having access to skilled care during pregnancy.

AbouZahr and Wardlaw (2004) argue that maternal mortality causes differ from region to region and from different settings, however their study asserts that ANC utilization contributes to the reduction of maternal and infant mortality(WHO/UNICEF, 2003). It has been noted that the leading causes of maternal mortality in developing countries are heamorrhage and hypertension accounting for half the deaths in expectant or new mothers (WHO, UNICEF,UNFPA,World Bank, 2010).

Many causes of maternal deaths are preventable and curable through improved access to ANC and other safe motherhood interventions. Perry and Gesler (2000) found that limited access to health care is a major obstacle to improved women's health. Access is multifaceted as it is influenced by numerous factors (Puentes-Markides, 1992; Wyss, 2003). Access can be defined as the ability to use ANC particularly the number of times a pregnant woman visited the healthfacility during the term of pregnancy. Access can be determined or prevented by the availability, perception of quality, affordability and social factors (WHO/UNICEF, 2003). Limited access to ANC is a big challenge in rural areas where there are fewer health care facilities and villages are physically isolated (Gross Alba, Glass and Schellenberg, 2012).

Poor ANC utilization is an international public health challenge especially in the developing countries. These countries accounted for 97% of the world population growth, from 7.0 billion in 2011 to 7.04 billion in mid-2012 (Haub, 2012). There has been reported a global rise in ANC utilization to about 70% between 1990 and 2013 and substantial progress achieved in most regions of the world, butNigeria and the proportion having a minimum of four ANC visits recommended by WHO are below the world's average despite having been declared asthe Africa's largest economy. This study would focus on relationship between level of hematinics usage andhealth dividend as far as ANC utilization is concerned. ANC utilization will play a vital role in increase use of hematinics and also a dual role in the attainment of the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs).

## 2.5    Preventing and Treating Anemia During Pregnancy

Iron supplementation (the use of hematinics), together with food-based approaches, is the mainstay of the control of iron-deficiency anemia (Fiedler, DAgostin, & Sununtnasuk, 2015). Poorcompliance (due to side-effects and the long duration of required daily intake), infrastructuralrestraints, high maintenance costs and the coexistence of other causes of anemia (parasiticinfections, other micronutrient deficiencies) are important factors leading to thereduction of the burden of anaemia (Dinga,2010)

As a result, attention has gone out to alternative strategies to combat anemia, including food fortification, mass-treatment with anthelmintic, malaria control (insecticide treated bed nets and intermittent antimalarial treatment), multi-micronutrient supplementation and intermittent iron treatment.

A key component of a safe motherhood initiative is to reduce maternal mortality by half, through the eradication of anaemia during pregnancy (Hogue et al., 2007).Control of anaemia among pregnant women is done through micronutrient supplementation of iron and folic acid during the ANC attendance. Correction of iron deficiency in pregnancy involves appropriate diet and oral iron supplementation. WHO recommends that all pregnant women in areas where anaemia is prevalent should receive supplements of iron and folic acid (WHO, 2008). Daily oral iron (60 mg) and folic acid (400 μg) should be commenced before conception, as soon as a woman becomes pregnant, and continued up to 6 months' postpartum.Intermittent iron supplementation, is cheap and due to less gastro-intestinal side effects, it isbetter tolerated and adhered to as compared toalternative daily supplementation. Intermittent iron has similar or greater absorption than daily supplementation (Dinga,2013).

Many studies have shown intermittent treatment to be more effective in the prevention of irondeficiency anemia under controlled conditions, albeit less effective than conventional dailyregimens, for example routine use of hematinics as recently concluded in a meta-analysis by (Beaton & McCabe),improved the effects on hematologicalrecovery together with reports that vitamin A supplementation offers protection against infectiousdiseases(Beaton & McCabe 2000) have led to increased interest in combined supplementation with vitamin A and iron. Pregnant women need iron to cover their basic losses, increased RBC mass and the demand from fetoplacental unit. It is recommended to take iron with orange juice to enhance its absorption.

Parenteral iron can be administered intramuscular (IM) or intravenous (IV). Studies have shown that low or moderate dose of iron/folate supplementation in early pregnancy has a positive effect on foetal growth in women with both adequate and deficient iron status (Rodriguez-Bernal, Rebagliato and Ballester, 2012).

## 2.6    Theoretical Framework: Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) was originally developed by Ajzen in 1985 from the Theory of Reasoned Action (Petraszko, 2013), and is based on highlighting the factors which ultimately influence an individual's decision to behave in a particular fashion. The theory believes that intent more than others strongly predicts an individual's actual behaviour, and that salient beliefs, attitudes, subjective norms, and perceived behavioral control (PBC) determine behavioral intention (Ajzen, 1991). In practice, the TPB is commonly used to predict health behaviors including women's decision to use hematinics during pregnancy (Pawlak, Connell, Brown, Meyer, & Yadrick, 2005; Pawlak et al., 2008).

Social cognitive approaches to understanding reasoning behind health behaviors have frequently utilized the Theory of Planned Behavior (TPB). This model, developed by Ajzen (1991), proposes that behavior most strongly results from the intention to perform a behavior. The TPB has shown success in predicting health behaviors related to drug use, sexuality, physical activity, smoking and nutrition (Armitage &Conner, 2001). Studies have utilized the TPB to predict choice of dietary supplement usage amongst groups of adults, women, and female collegiate athletes (McDonaldson& Nicholson, 2006; Conner, Kirk, Cade, and Barrett, 2003; Housman, Dorman, Pruitt, Ranjita, & Perko, 2011). Limited research has been conducted to predict the intention to use or actual use of hematinics during pregnancy amongst mothers of under-2years (Pawlak et al., 2008; Pawlak et al., 2005).The TPB provides a framework for examining factors that may influence an individual'sintention to engage in a behavior. While behavioral intention is most closely associated withactual behavior, the TPB proposes that three additional factors: attitudes towards the behavior,subjective norms, and perceived behavioral control (PBC) over the behavior influence behavioralintention. Salient beliefs of behavioral, control, and normative beliefs further influence suchfactors (Ajzen, 1991).

Attitudes towards a certain behavior stem from one's evaluation of the behavior and theconsequences of engaging in that particular behavior. The theory postulates that if one perceives

the outcomes of a behavior to be positive and assigns a high value to such consequences, then his or her attitude towards the behavior is favorable. This in turn is thought to influence theindividual's intention to perform the given behavior, and subsequently his or her decision toengage in the behavior (Ajzen, 1991).Social pressures to perform or not perform a given behavior constitute subjective norms.If an individual believes a behavior to be considered acceptable by his/her social group, theindividual is more likely to report intention to perform the behavior (Ajzen, 1991).PBC is defined as one's perceived ability to willfully engage in a particular behavior. In otherwords, how easy/convenient or difficult/inconvenient it is to perform a certain behaviour.Situational factors, such as access to healthcare services and health information, importantas well as internal factors including knowledge of how to perform health behaviors affect perceived behavioral control. A high PBC is associated with behavioral intention and subsequent execution of that behavior when perceptions of control accurately reflect actual control (Ajzen, 1991; Armitage & Conner, 2001).

## 2.6.1  Adaptation of theoretical Framework

Reasons for use of the theory of planned behaviour in this study are wide and complex. Social, psychological, and knowledge factors have been shown to influence an individual's decision on the utilization of hematinics during pregnancy. The TPB is used herein to predict health behaviors determining decision to consume hematinics in this study.Consistent with the TPB model, willingness to use hematinics supplements would be shown to be the most important direct predictor of hematinics use amongst mothers of under-2years when they were pregnant in Ibadan North East Local Government Area. Knowledge and perception are also shown as important predictors of utilization. Analysis of the Theory of Planned Behaviour constructs in the context of Hematinics use is done to determine or provide insight as to the specific attitudes, subjective norms and knowledge that prompt intention to subsequently use, and not to use of Hematinics supplements.

**Conceptual Framework**
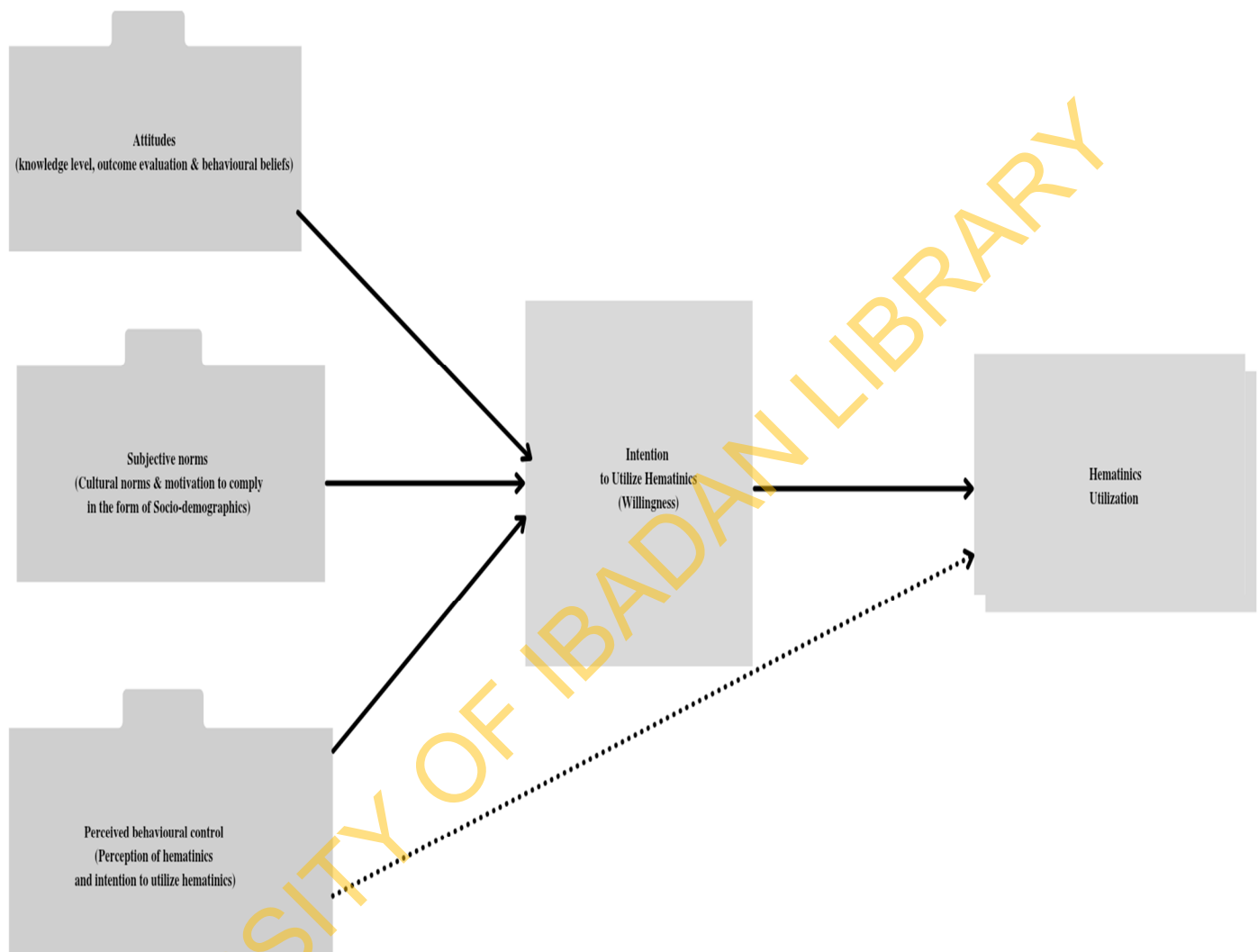
Fig. 2.1: Conceptual Framework

Derived from Ajzen's model, this conceptual framework regarding the utilization of hematinics by mothers of under-two during their stages of pregnancy shows the links between attitudes, norms, behavioural control and intention to utilize hematinics. Attitude of mothers of under-two about hematinics utilization is an aggregate of mothers' knowledge levels about hematinics, their subjective personal beliefs about the importance of using such hematinics and the outcomes that

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they believe may or may not occur with or without use of the hematinics during pregnancy. Also depicted at the first phase alongside attitude of mothers are subjective norms which comprise of cultural norms including cultural beliefs and practices as well as the motivation to comply to such cultural beliefs and practices. The motivation to comply is often in the form of socio-demographic characteristics of mothers of under-two during their stages of pregnancy such as age, household size, personal and household income, presence of extended family members, ability to contribute to the family and make independent decisions. Perceived behavioural control which makes up the third determinant in the first phase of making the decision to utilize hematinics is made up of the individual's perception of hematinics as well as the perception of the intention to utilize hematinics. This serves has a control for the intention to utilize hematinics and directly impacts upon both phases two, that is the intention or willingness to utilize hematinics, and the final phase which is the act of hematinics utilization. Whilst all three of attitudes, subjective norms and perceived behavioural control all add up to determine intention, perceived behavioural control may or may not subsequently affect the utilization much later in the decision-making process.

# CHAPTER THREE

# METHODOLOGY

## 3.1    Research Design

The study adopts a survey design which is descriptive in its purpose and cross-sectional in its time dimension, to assess the various factors associated with the utilization of hematinics among mothers of under-two in Ibadan North East Local Government Area Oyo state. This design enables the researcher to obtain information, interpret, summarize, and present such gathered information about the situation at hand at any one specific point in time, and describes the current situation for the purpose of clarification among the desired population (Orodho, 2004).

## 3.2    Study Area

The study site isIbadan North East Local Government Area Oyo state.Ibadan, the largest indigenous city in tropical Africa, is the capital of Oyo state, it is centrally situated in the South-western sector of the country, the city is made up of 11 Local Government Areas five in the inner urban area (one of which is Ibadan North East LGA), and six in the outer rural area.Ibadan North East Local Government Area with headquarters in Iwo Road has a population of about 275,629, a projected population of 367,944 22 made up of 163,844 males and 167,600 females and 76,655 households (National Bureau of Statistics, 2013).

The majority being of the Yoruba ethnic group, whilst persons of other ethnic origins also are resident.It has a small land cover, but it is one of the largest populated LocalGovernment in Ibadan (National Bureau of Statistics, 2010). It is a commercial centre, where there are various economic activities such as: markets, Health centre, Private hospital, transportation system and industrial services, these made this Local Government Area very full. All these factors contributed to high vulnerability of poor health outcome (Hambali et. al, 2014).

## 3.3    The Study Population

The study population is comprised of women within the reproductive ages 15-49 years who have under-two children, and live in Ibadan North East Local Government Oyo state. These

set of people are however chosen because they would have at a point passed through pregnancy phase.

### 3.4.1   Inclusion criteria

Mothers of under-two children aged 15-49 years who are residents of Ibadan North East local government Oyo state and were willing to participate in the study.

### 3.4.2   Exclusion criteria

Mothers of under-two children aged 15-49 years who are residents of Ibadan North East local government Oyo state but sick or not willing to participate in the study.

### 3.5   Sampling size and sample techniques

### 3.5.1   Sample size determination

The total population exceeded 10,000 thus the formula below was used to determine the sample size (Fischer et al., 1998 cited in Kothari, 2004).

$n = (Z^2 \times p \times q)/d^2$

n = the desired sample size

Z= the standard normal deviate at the required confidence level in this case 1.96

p= the proportion of the target population estimated to have characteristic being measured. Proportion of pregnant mothers is 11.9% (NPC and ICF International, 2014)

q=1-p

d= the level of accuracy of the statistic to be measured

$n = 1.96^2 x 0.119 x 0.881/0.05^2$

Sample Size (n) proposed is 161

However, a sample of 177 was used in the study with an addition of (10%) 16 to take care of non-respondents.

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### 3.5.2   Sampling Techniques

Purposive samplingwas employed, as it focuses on selecting participants with the best possible knowledge, or overview on the topic of study, and who have the required traits needed for this study (Hoepfl, 1997). The selected respondents were residents of the Local Government Area who fit the criteria stipulated in the inclusion criteria and who were willing to partake in the study. The study sought a homogenous sample purposively sampled with maximum variation in socio-demographic characteristics. These respondents were sampled at their homes, with one participant sampled per house.

### 3.6   Data Collection Instrument

Structured questionnaire was administered to all eligible mothers of under-two children. Five different sections of the questionnaire which were focused on socio-demographic characteristics of respondents which includes ages, ethnicity, religion, parity, and others; respondents' knowledge of the types and effects of hematinics; respondents' perceptions of the choice of hematinics, and respondents' willingness to utilize routine ANC hematinic drugs (Frequency of intake daily).

### 3.7   Variables

The independent variables in this study are the socio-demographic characteristics. The dependent variables are: the level of knowledge about haematinics, the perceptions of utilization of routine hematinics drugs, the willingness to utilize ANC routine hematinic drugs, among mothers of under two years in Ibadan North East local Government Area, Oyo state.

### 3.8   Validityand Reliability of Research Instrument

Prior to the administration of the instrument, the instrumentwas subjected to standardization procedure of validity and reliability. Validity makes reference to how much a test measures what the researcher actually wishes to measure (Mugenda & Mugenda, 2003). This was done using

face validity in which the project supervisor as well as other professionals looked at the questionnaire items. While reliability describes the ability of an instrument to consistently elicit similar responses or result from different but similar population of respondents. Reliability of the instrument was established by conducting a pre-test among 10% of estimated sample size with the draft of questionnaire in a similar location Ayeye, in Ibadan North West LGA which has similar characteristics with the study area so as to determine its consistency and accuracy.

## 3.9 Ethical Considerations

Ethics approval from the Oyo State Ministry of health was obtained upon review by the Oyo State, Research Ethics Review Committee  (Ref No. AD 13/479/1397).All community entry protocolssuch as reaching out to community gate-keepers that is the community development association leaders of communitieswithin the LGA. The respondents were told about the purpose of the study, the risks and benefits for participation and obtained informed consent. Confidentiality and anonymity were also ensured by not linking respondents' responses to their identities.

## 3.11 Data Management and Analysis

After data collection, each questionnaire set was checked for completeness and accuracy while on the field. Serial numbers wereassigned to each questionnaire for easy identification, and also for correct data entry and analysis. The data wascoded, cleaned, and analysed using SPSS statistical tool version 24.0.Descriptive statistics such as the use of frequency tables, mean, pie and bar charts as well as Inferential statistics such as chi-square and t-test were conducted to reach conclusions regarding the collected data. Knowledge score was measured using a 10 point scale, where people who score above 5 would be regarded as good knowledge, while respondents with below 5 score would categorized as low knowledge score.

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# CHAPTER FOUR

## RESULTS

### 4.0 Socio-Demographic Characteristics of Respondents

Table 4.1 below highlights the frequency distribution of the socio-demographic characteristics of the respondents of the study. The first five demographic variables of the mothers of children under two years of age were presented detailing their different socio-demographics while the other variables focused on indices such as their place of delivery, parity and gestational age at the start of use of hematinics. Out of the 190 respondents, only one respondent was aged between 41 – 45 years of age while 44.7% were aged between 26 and 30 years. The second highest age group was that of those aged 21 to 25 with 24.7% of the sample size. The mean age of respondentsis 28.7±4.7 years

Among the 190 mothers of under-two sampled, the majority were Yoruba (90.4%), while other ethnic groups constituting 6.4% while Hausa (2.7%) and Igbo ethnic groups (0.5%) made up the rest of the sampled respondents.

Table 4.1 also shows the distribution of respondents by religious affiliation with only two religious groups reflecting in the study, and muslim respondents slightly edging out their Christian counterparts with 53.2% to 46.8% respectively. Majority of the respondents are self-employed as artisans and traders (88.5%), with only 4.2% and 2.6% being civil servants and housewives' respectively. In terms of levels of educational attainment, barely over one-fourth of the respondents had any form of tertiary education while majority (41%) had completed secondary school education with only 5.8% having no form of formal education.

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In terms of health seeking behaviour and pregnancy-related demographics, 67.9% of the sample size utilized formal health care facilities that is privately owned and publicly owned health centres, while 32.1% had their deliveries at home and in Faith based clinics or TBAs. Almost three out of every five respondents had more than two children prior to the study while only 45.3% had only one child in the same time frame. Additionally, only 106 respondents representing 55.8% stated that they had used hematinics during pregnancy with others not using. Of the 106 respondents, 74 respondents started using in the second trimester and only 9 persons used it in the third trimester (Table 4.2).

**Table 4.1a: Sociodemographic characteristics of respondents (N=190)**

| Sociodemographic characteristics | Frequency | Percent |
|---|---|---|
| **Age** | | |
| 16-20 | 7 | 3.7 |
| 21-25 | 47 | 24.7 |
| 26-30 | 85 | 44.7 |
| 31-35 | 34 | 17.9 |
| 36-40 | 16 | 8.4 |
| 41-45 | 1 | 0.5 |
| | | |
| Mean age of respondents is 28.7±4.7 years | | |
| | | |
| **Ethnicity** | | |
| Yoruba | 170 | 90.4 |
| Hausa | 5 | 2.7 |
| Igbo | 1 | 0.5 |
| Others | 14 | 6.4 |
| **Occupation** | | |
| Civil Servant | 8 | 4.2 |
| Self-employed | 168 | 88.5 |
| Housewife | 5 | 2.6 |
| Unemployed | 1 | 0.5 |
| Student | 8 | 4.2 |
| **Religion** | | |

| | | |
|---|---|---|
| Christianity | 89 | 46.8 |
| Islam | 101 | 53.2 |

**Table 4.1b    Sociodemographic characteristics of respondents contd. (N=190)**

| Sociodemographic characteristics | Frequency | Percent |
|---|---|---|
| **Education** | | |
| No formal education | 11 | 5.8 |
| Primary | 52 | 27.4 |
| Secondary | 78 | 41 |
| Tertiary | 49 | 25.8 |
| **Place of Delivery** | | |
| Private Hospital | 49 | 25.8 |
| Government Health Facility | 80 | 42.1 |
| TBA / Faith based clinic | 36 | 18.9 |
| Home | 25 | 13.2 |
| **Parity** | | |
| One child | 86 | 45.3 |
| Two – three | 76 | 40 |
| Four and above | 28 | 14.7 |

**Table 4.2: Respondents use of Hematinics during pregnancy(N=190)**

| Use of Hematinics during pregnancy | Frequency | Percent |
|---|---|---|
| **Hematinics during pregnancy** | | |
| Yes | 106 | 55.8 |
| No | 84 | 44.2 |
| **Stage at start of use of Hematinics** | | |
| First trimester | 23 | 12.2 |
| Second trimester | 74 | 38.9 |
| Third trimester | 9 | 4.7 |
| Not used | 84 | 44.2 |

**4.1.2 Section B: Knowledge of Hematinics**

Variables highlighting the level of knowledge about hematinics among mothers of children under the age of two in Ibadan North East Local Government Area are highlighted in Table 4.2 presented below which detail responses to research question one of the study. The Table 4.2 details the responses of 190 respondents to a question asserting the level of knowledge among study participants by checking their self-acclaimed levels of knowledge of hematinics. Eighty-four percent (159 persons) of the respondents responded in the affirmative to knowing about hematinics while 16% (31) responded negatively.

Table 4.2 further sought to clarify these levels of knowledge by asking about the cause of anaemia which is acknowledged as the reason for the use of hematinics, the sources of their knowledge, and the identification of examples of hematinics among respondents. Despite the high levels of self-acclaimed knowledge about hematinics, only approximately 2 out of every 5 persons questioned knew that anaemia is caused by shortage of blood, while 116 respondents thought that was not the case. Of the 190 respondents, only 136 persons claimed to have received their knowledge from health facilities, while only 17.9% sourced their knowledge from the media. Ferrous sulphate was identified by 71.1% of the participants, 56.3% identified Folic acid as hematinic, 55.8% and 57.4% identified Zinc and Vit B12 respectively as examples of hematinics (Table 4.3). Respondents were grouped on the basis of knowledge with those scoring between 1 and 5 deemed as having poor knowledge, and those with scores between 6 and 10 having good knowledge. The percentage of those with good knowledge scores was 63.7%, with about 9 out of every 25 persons deemed as having bad knowledge.

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Also, when asked about the consequences caused by lack of hematinic use during pregnancy, 79 of total respondents (58.4%) attested to the fact that non usage of Hematinic can cause Albinism, 69 (36.3%) agreed it would lead to Low Birth Weight, while just 74 (38.9%) answered yes to Anaemia.

**Table 4.3 Respondents' Knowledge of Hematinics(N=190)**

| Knowledge | Frequency | Percent |
|---|---|---|
| **Know what hematinics are** | | |
| Yes | 159 | 84.0 |
| No | 31 | 16.0 |
| **Shortage of blood cause anaemia** | | |
| Yes | 74 | 38.9 |
| No | 116 | 61.1 |
| **Source of information of hematinics** | | |
| Clinics | 136 | 71.6 |
| Relatives | 4 | 2.1 |
| Media | 34 | 17.9 |
| Friends | 16 | 8.4 |

**Table 4.4: Knowledge of Hematinics by Respondents(N=190)**

| Knowledge of Hematinics | Frequency | Percent |
|---|---|---|
| Paracetamol | 135 | 71.1 |
| Ferrous Sulphate | 135 | 71.1 |
| Flagyl | 114 | 60.0 |
| Vit B12 | 109 | 57.4 |
| Folic Acid | 107 | 56.3 |
| Zinc | 106 | 55.8 |
| Piriton | 97 | 51.1 |

*Multiple responses included*

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**Table 4.5: Knowledge on diseases caused due to lack of Hematinics**

| Question | Frequency | Percent |
|---|---|---|
| Lack of Hematinics does not cause Albinism | 111 | 58.4 |
| Lack of Hematinics does not cause Low Birth Weight | 104 | 63.6 |
| Lack of Hematinics causes Anaemia | 74 | 38.9 |

**\*Multiple responses included**

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### 4.1.3 Factors Affecting Utilization of Hematinics

This section focuses on the second research question which seeks to highlight the factors hindering the utilization of hematinics among mothers of under two years of age in Ibadan North East Local Government Area. Poor family support (65.3%) and inability to make decisions at home (59.5%) tallied the highest percentages, and knowledge of hematinics gained (35.3%) as well as cultural factors (43.7%) for the factors hindering utilization. Others included: religion, financial constraints, cost of drugs, distance to supply, peers etc, (Table 4.6).

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**Table 4.6i: Factors hindering Utilization of hematinics**

| Factors hindering utilization | Frequency | Percent |
|---|---|---|
| Poor family support | 124 | 65.3 |
| Inability to make decisions at home | 113 | 59.5 |
| Cost of drugs | 109 | 57.4 |
| Financial constraints | 99 | 52.1 |
| Distance to facility or supply point | 97 | 51.1 |
| Religion | 96 | 50.5 |
| Peers Influence | 88 | 46.3` |
| Influence of TBA in community | 86 | 45.3 |
| Cultural factors | 83 | 43.7 |
| Knowledge about hematinics | 67 | 35.3 |

**\*Multiple responses included**

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## 4.1.4 Perceptions about Hematinics

The Table 4.7 highlights the perceptions of hematinics among mothers of under two children highlighting general statements with regards to the supposed characteristics of hematinics among mothers in response to research question three. The table 4.11 notes that more women (68.9%) had positive opinions about hematinics than those who held negative views. Slightly more than 52% respondents however opined that it was unnecessary to purchase hematinics. Fewer respondents (29.5%) agreed that constipation may be caused by using hematinics, while 47.4% agreed that hematinics are smelly, with one less person (46.8%) agreeing that it may cause nausea.

**Table 4.7: Perceptions of mothers of under two on hematinics**

| Statement | Agree (%) | Undecided (%) | Disagree (%) |
|---|---|---|---|
| Positive opinions of hematinics | 131 (68.9) | 29 (15.3) | 30 (15.8) |
| Herbal preference among relatives | 89 (46.8) | 10 (5.3) | 91 (47.9) |
| Hematinics are smelly | 90 (47.4) | 17 (8.9) | 83 (43.7) |
| Nauseated by hematinics | 89 (46.8) | 11 (5.8) | 90 (47.4) |
| Heartburns are associated with hematinics | 83 (43.7) | 8 (4.2) | 99 (52.1) |
| Hematinics cause constipation | 56 (29.5) | 21 (11.0) | 113 (59.5) |
| It causes diarrhea | 76 (40.0) | 8 (4.2) | 106 (55.8) |
| It is unnecessary to purchase | 100 (52.6) | 21 (11.0) | 69 (36.4) |

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### 4.1.5 Willingness to use Hematinics

This section focuses on research question four which attempts to explore the willingness to utilize hematinics among mothers of under two years of age in Ibadan North East Local Government Area. Eighty-eight respondents (46.3%) claimed to have had complications during their pregnancies. Figure 1 below shows the distribution of these complications. Also, willingness to utilize hematinics was measured with responses to certain indicators including willingness to use hematinics in subsequent pregnancies (48.9%), hematinics utilization before pregnancy (72.1%), PCV checks during pregnancy (32.6%), as well as consistency of usage during said-pregnancy (42.6%).
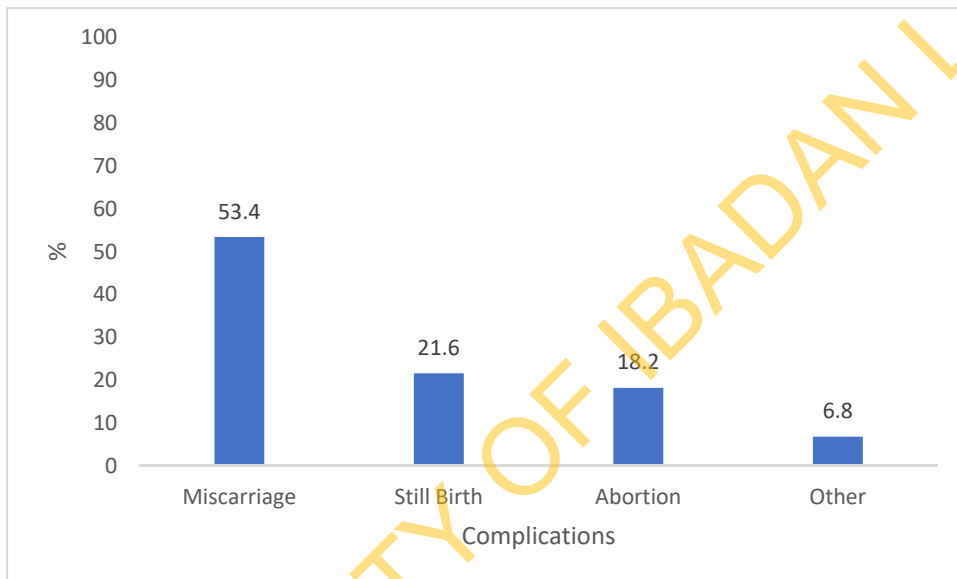
**Fig 1. Complications experienced during pregnancy**

**Table 4.6: Respondents sources of hematinics**

| Source of Hematinics | Frequency | Percentage |
|---|---|---|
| Other sources | 84 | 44.2 |
| Patent medicine vendors | 60 | 31.6 |
| Public hospital Pharmacy | 17 | 8.9 |
| Private hospital | 15 | 7.9 |
| Private pharmacy | 14 | 7.4 |

**Test of Hypotheses**

**Hypothesis one: There is no significant association between socio-demographic information and knowledge levels of mothers of under two**

The mean knowledge score was calculated to be 4.9 ±1.7.The tables 4.8 and 4.9 below focuses on the cross-tabulation of knowledge groups with socio-demographic characteristics, and questions regarding age (p-value = 0.225), parity (p-value = 0.129), education (p-value = 0.073), knowledge preventing utilization, adherence to use during pregnancy, necessity to purchase, stage of pregnancy at first use among others. None of the questions cross-tabulated is noted as being significantly associated with knowledge in groups, although 53.6% of the respondents with poor knowledge also failed to adhere to utilization, while 56.5% were unwilling to utilize hematinics in subsequent pregnancies.

Table 4.10 below enlarges the statistic on knowledge scores noting that there is a significant difference (p = .041) in the mean knowledge scores of women with more than one live births (4.71) and those with just one live births (5.21), with the scores of the latter being noted as better than those of the former.

**Table 4.8: Cross-tabulation of Knowledge Groups with Sociodemographic characteristics**

| Variables | Knowledge Groups | | P-value | $\chi^2$ |
|---|---|---|---|---|
| | Good (%) | Poor (%) | | |
| **Age Group** | | | 0.225 | 6.943* |
| 16-20 | 3(2.5) | 4(5.8) | | |
| 21-25 | 25(20.7) | 22(31.9) | | |
| 26-30 | 58(47.9) | 27(39.1) | | |
| 31-35 | 24(19.8) | 10(14.5) | | |
| 36-40 | 11(9.1) | 5(7.2) | | |
| 41-45 | 0(0.0) | 1(1.4) | | |
| **Parity** | | | | |
| One Child | 59(48.8) | 27(39.1) | 0.129 | 1.645 |
| > 1 child | 62(51.2) | 42(60.9) | | |
| **Knowledge preventing Usage** | | | 0.052 | 3.203 |
| Yes | 37(30.6) | 30(43.5) | | |
| No | 84 (69.4) | 39(56.5) | | |
| **Highest level of education** | | | 0.073 | 6.976* |
| No formal education | 3 (2.5) | 8 (11.6) | | |
| Primary education | 33 (27.3) | 19 (27.5) | | |
| Secondary education | 53 (43.8) | 25 (36.3) | | |
| Tertiary education | 32 (26.4) | 17 (24.6) | | |
| **Religion** | | | 0.483 | 0.492 |
| Christianity | 59(31.1) | 30(15.8) | | |
| Islam | 62(32.6) | 39(20.5) | | |
| **Marital Status** | | | 0.418 | 0.656 |
| Married | 110(57.9) | 65(34.2) | | |
| Not married | 11(5.8) | 4(2.1) | | |

**\*Fisher exact**

**Table 4.9: Cross-tabulation of Knowledge groups with variables of willingness to use**

| Variables | Knowledge | | p-value | χ² |
|---|---|---|---|---|
| | Good (%) | Poor (%) | | |
| **Compliance to usage** | | | 0.262 | 0.621 |
| Yes | 49(40.5) | 32(46.4) | | |
| No | 72(59.5) | 37(53.6) | | |
| **Necessary to purchase** | | | 0.402 | 0.158 |
| Agree | 65(53.7) | 35(50.7) | | |
| Disagree | 56(46.3) | 34(49.3) | | |
| **Willingness to use in subsequent pregnancies** | | | 0.162 | 1.297 |
| Yes | 63(52.1) | 30(43.5) | | |
| No | 58(47.9) | 39(56.5) | | |
| **Stage atstart of Hematinics** | | | 0.628 | 1.742 |
| 1st trimester | 13(10.7) | 10(14.5) | | |
| 2nd trimester | 51(42.1) | 23(33.3) | | |
| 3rd trimester | 6(5.0) | 3(4.3) | | |

**Table 4.10: Knowledge Mean difference by Parity**

| | Parity | N | Mean | Std. Deviation | Std. Error Mean | Sig. |
|---|---|---|---|---|---|---|
| **Knowledge score** | One Child | 86 | 5.21 | 1.542 | 0.166 | .041 |
| | More than one | 104 | 4.71 | 1.744 | 0.171 | |

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**Hypothesis Two: There is no significant association between socio-demographic characteristics and utilization factors among mothers of under two**

Table 4.11 shows a cross-tabulation of the factors affecting utilization of hematinics and the Knowledge groups of respondents, whilst the Table 4.12 below it highlights the association and relationship status of the use of hematinics in pregnancy and the factors highlighted as affecting its utilization. On Table 4.11, Financial constraints and Distance are noted as being significant (p-value = 0.01; 0.05) with knowledge groups while the table 4.12 shows that factors such as distance to supply point (0.002), cultural factors (0.044), cost of drugs (0.003), poor family support (0.02), and inability to make decisions at home (0.025) have significant association with the use of hematinics during pregnancy, whilst mainly showing weak negative relationships across the variable being observed.

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**Table 4.11: Cross-tabulation of Factors affecting utilization and Knowledge groups**

| Factors that could affect the use of Hematinics | Knowledge | | $\chi^2$ | P. Value |
|---|---|---|---|---|
| | Good (%) | Poor (%) | | |
| **Financial constraints** | | | | |
| Yes | 55(28.9) | 44(23.2) | 5.906 | 0.01* |
| No | 66(34.7) | 25(13.2) | | |
| **Distance from purchase** | | | 3.036 | 0.05* |
| Yes | 56(29.5) | 41(21.6) | | |
| No | 65(34.2) | 28(14.8) | | |
| **Cost of Hematinics** | | | 2.729 | 0.0763 |
| Yes | 64(33.7) | 45(23.7) | | |
| No | 57(30.0) | 24(12.7) | | |
| **Poor Family Support** | | | 1.581 | 0.136 |
| Yes | 75(39.4) | 49(25.7) | | |
| No | 46(24.3) | 20(10.6) | | |
| **Peer Influence** | | | 0.000 | 0.55 |
| Yes | 56(29.5) | 32(16.9) | | |
| No | 65(34.2) | 37(19.5) | | |
| **Low decision making** | | | 0.871 | 0.218 |
| Yes | 75(39.5) | 38(20.0) | | |
| No | 46(24.2) | 31(16.3) | | |

**\*Significant**

**Table 4.12: Association of hematinics utilization and factors affecting utilization**

| Variables | Utilization | | $\chi^2$ | P.Value |
|---|---|---|---|---|
| | YES (%) | NO (%) | | |
| **Knowledge about Hematinics** | | | 0.529 | 0.283 |
| Yes | 35 (18.4) | 32 (16.8) | | |
| No | 71 (37.4) | 52 (27.4) | | |
| **Religious Factor** | | | 0.559 | 0.274 |
| Yes | 51 (26.8) | 45 (23.7) | | |
| No | 55 (28.9) | 39 (20.6) | | |
| **Culture** | | | 3.448 | 0.044* |
| Yes | 40 (21.1) | 43 (22.6) | | |
| No | 66 (34.7) | 41 (21.6) | | |
| **Financial Constraint** | | | 1.531 | 0.244 |
| Yes | 51 (26.8) | 48 (25.3) | | |
| No | 55 (28.9) | 36 (19.0) | | |
| **Distance** | | | 8.738 | 0.002* |
| Yes | 44 (23.2) | 53 (27.9) | | |
| No | 62 (32.6) | 31 (16.3) | | |
| **Cost of Hematinics** | | | 8.397 | 0.003* |
| Yes | 51 (26.8) | 58 (30.5) | | |
| No | 55 (28.9) | 26 (13.8) | | |
| **Poor Family Support** | | | 4.851 | 0.020* |
| Yes | 62 (32.6) | 62 (32.6) | | |
| No | 44 (23.2) | 22 (11.6) | | |
| **Peer Influence** | | | 3.188 | 0.051 |
| Yes | 43 (22.6) | 45 (23.7) | | |
| No | 63 (33.1) | 39 (20.6) | | |
| **Low Decision Making** | | | 4.390 | 0.025* |
| Yes | 56 (29.5) | 57 (30.0) | | |
| No | 50 (26.3) | 27 (14.2) | | |
| **TBA Influence** | | | 0.764 | 0.233 |
| Yes | 45 (23.7) | 41 (21.6) | | |
| No | 61 (32.1) | 43 (22.6) | | |

*Significant

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**Hypothesis Three: There is no significant association between socio-demographic information and willingness of mothers of under two to utilize hematinics**

The Table 4.13 shows the association and chi-square value between the willingness to check pcv and use hematinics as 0.001 and 10.52 respectively to highlight how the checking of pcv prompt a willingness to use hematinics. Forty-five of the respondents engaged in PCV check and utilized hematinics during pregnancy (Table 4.13). Also, while Table 4.13 notes association between gestational age at use of hematinics, and the checking of PCV (p-value = 0.010; $\chi^2$ = 11.357), Table 4.14 shows significant association between level of education and the use of hematinics even before pregnancy (p-value = 0.005; $\chi^2$ = 12.803) with 55 of the 78, and 31 of the 49 who indicated completing Secondary and Tertiary levels of education replying positively to using hematinics prior to pregnancy.

Table 4.15shows significance in the association levels between adherence to use of hematinics during pregnancy with education (p-value = .009; $\chi^2$ = 11.562). Table 4.15 however does not show such significance in the association levels between adherence to use of hematinics during pregnancy with parity (p = .110; $\chi^2$ = 1.889). Table 4.16 is shown below as depicting a cross-tabulation of the willingness of participants in the study to utilize hematinics in subsequent pregnancies as against the socio-demographic characteristics of age, education and parity. As noted, there is no significant association for any of the variables cross-tabulated with willingness to use hematinics in subsequent pregnancies as the p-values of age, education and parity are 0.588, 0.792 and 0.886 respectively.

**Table 4.13: Association of PCV check with Utilization and gestational age**

| Indicator | PCV check | | p-value | $\chi^2$ |
|---|---|---|---|---|
| | Yes (%) | No (%) | | |
| **Use of hematinics in pregnancy** | | | | |
| Yes | 45(23.7) | 61(32.1) | 0.001* | 10.520 |
| No | 17(8.9) | 67(35.3) | | |
| **Gestational Age** | | | 0.010* | 11.357 |
| 1-3 months | 10(9.4) | 13(12.3) | | |
| 4-6 months | 30(28.3) | 44(41.5) | | |
| 7-9 months | 5(4.7) | 4(3.8) | | |

*Significant

**Table 4.14: Association of education with use of hematinics before pregnancy**

| | Use of hematinics | | p-value | $\chi^2$ |
|---|---|---|---|---|
| **Highest level of education** | **Yes(%)** | **No(%)** | | |
| No formal education | 5(2.6) | 6(3.2) | 0.005* | 12.803 |
| Primary Education | 46(24.2) | 6(3.2) | | |
| Secondary Education | 55(28.9) | 23(12.1) | | |
| College of education/polytechnics | 31(16.3) | 18(9.5) | | |

**\*Significant**

**Table 4.15: Association of adherence to use of hematinics with education and parity**

| Variables | Adherence to use | | p-value | |
|---|---|---|---|---|
| | YES(%) | NO(%) | | $\chi^2$ |
| **Level of Education:** | | | 0.009* | 11.562 |
| No formal education | 6 (7.4) | 5 (5.6) | | |
| Primary Education | 14 (17.3) | 38 (34.9) | | |
| Secondary Education | 43 (53.1) | 35 (32.1) | | |
| Tertiary Education | 18 (22.2) | 31 (28.4) | | |
| **Parity:** | | | | |
| One child | 32 (39.5) | 54 (49.5) | 0.110 | 1.889 |
| > 1 child | 49 (60.5) | 55 (50.5) | | |

**\*Significant**

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**Table 4.16: Cross-tabulation of willingness against socio-demographic characteristics**

| Variables | Willingness | | $\chi^2$ | P.Value |
|---|---|---|---|---|
| | Willing(%) | Not willing(%) | | |
| **Age Group** | | | | |
| 16-20 | 4(2.1) | 3(1.6) | | |
| 21-25 | 20(10.5) | 27(14.2) | 3.738 | 0.588 |
| 26-30 | 46(24.2) | 39(20.5) | | |
| 31-35 | 14(7.5) | 20(10.5) | | |
| 36-40 | 8(4.2) | 8(4.2) | | |
| 41-45 | 1(0.5) | 0(0.0) | | |
| **Parity** | | | | |
| One Child | 43(22.6) | 43(22.6) | 0.070 | 0.792 |
| > 1 child | 50(26.3) | 54(28.5) | | |
| **Highest level of education** | 6(3.2) | 5(2.6) | 0.645 | 0.886 |
| No formal education | 25(13.2) | 27(14.2) | | |
| Primary education | 40(21.1) | 38(20.0) | | |
| Secondary education | 22(11.5) | 27(14.2) | | |
| Tertiary education | | | | |

# CHAPTER FIVE

## DISCUSSION, CONCLUSION AND RECOMMENDATIONS

**5.1 Discussion**

The World Health Organization in the year 2012 had declared a comprehensive plan on maternal, infant and young child nutrition that highlighted six global nutrition targets for 2025. The second target of this six was the minimization of the rate of anemia among women of reproductive ages to 50% by 2025 (WHO 2014b). The reason for this was largely due to the global public health initiatives which have proved effective and ensured that anemia prevalence has been reduced by 12% across the world between 1995 and 2011. It is notable that among pregnant women, this has reduced from 43% to 38% while in non-pregnant women, this reduction has been from 33% to 29%. However, this notably is an achievement that is largely inadequate to meet the 2025 target (WHO 2014a).

Based on the table 4.1, it appears that a higher proportion of mothers of under two year old children had utilized ANC services in either government owned or privately owned clinics. Approximately sixty-eight percent of the sampled respondents have utilized formal health care facilities as opposed to those who have utilized either TBAs or faith based places. ANC is defined as the care that is given to a pregnant woman and her unborn baby throughout the pregnancy (WHO/UNICEF, 2003). Many of the socio-demographic characteristics of the respondents in the analysis had non-significant association with the decision to utilize hematinics among mothers of children under the age of two. As noted equally, majority of the respondents could at least read and write due to being educated up to secondary school level, and as such could understand clinic and media messages on hematinics and the need for the utilization.

Educational status also was noted on Table 4.9 as correlating with the use of hematinics prior to pregnancies meaning that increased levels of education allowed for adherence to drug prescription during bouts of illness or using hematinics as food supplements over time. Moreover, one hundred and four respondents had more than one live birth as noted on Table 4.1, and had as such been most likely to have heard of hematinics prior to the most recent birth. Socio-demographic factors that prevented women from taking hematinics were lack of

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education, low socioeconomic status, advanced maternal age and poor use of antenatal care services (Nisar et al. 2014a).

Importantly as must be noted, with regards to knowledge on many of the sampled persons (136) highlighted that they had learnt about hematinics from clinics (Table 4.2). However as observed by Ling (2016), Bintabara et al (2015) and Debelew et al (2014), knowledge does not necessarily translate into practice, and worse yet when the self-acclaimed knowledge is not even able to define certain fundamental issues such as the link between anaemia and shortage of blood. Added to this is the failure of many respondents to identify examples of hematinics with it being that only in one situation is a significant number able to highlight Ferrous sulphate as a hematinic. Findings from previous studies showed that family, particularly husbands, supported their wives to take hematinics (Wiradnyani et al. 2016, Tinago et al. 2017). Findings from this study also found that women in the social circle do not necessarily exert considerable influence in shaping attitudes toward hematinics; and most of the pregnant women do not necessarily discuss their health issues with other women in their neighborhood, as such influence of peers is noted as lesser (Hisam et al. 2014, Nisar et al. 2014b).

Similar studies by Erkkola *et al*. (1998), and Dinga (2013) found that most women in pregnancies failed to consistently adhere to hematinic usage with them often citing a lack of directive in their cases from the primary health care personnel to purchase more. While in studies by Galloway *et al*., (2002) and Ritsuko *et al*. (2006) in Vietnam where it was shown that inadequate supplies served as barriers to adherence, in this study, physical and socio-cultural factors such as distance to supply point, cultural factors, cost of drugs, poor family support, and inability to make decisions at home are indicted as key barriers to utilization. Additionally, women's levels of education were noted as being significantly associated to adherence to utilization instructions. Also as additionally noted by Dinga (2013) as well, almost one-third of the pregnant women in her study were not directed on where to get hematinics.

Knowledge on hematinics was a bit low with a mean of 4.94, and many respondents misidentified drugs such as flagyl and piriton as hematinics whilst erroneously stating that such drugs as Ferrous sulphate and Vitamin B12 were not. This is explained away by Dinga (2013) who observed that health workers simply give pregnant women some pieces of paper with names

of drugs scribbled on them without adequate explanation on what these are, what they will do for the health of the woman and her foetus, and where to get them from. Parity is also observed to be associated, and with knowledge significantly differentacross groups of parity, being higher among women with lower parity, and lower among women with higher parity. This is relatable to the prevalence of anaemia in pregnant women in some studies with women with higher parity showing higher prevalence (Bassi, Idoko, Dibigbo-Ibeaji, Adeniyi et.al, 2016). A similar studyalso found that 85.3% of grand multiparous compared to 65.5% of all primigravida women had varying degrees of anaemia (Adewara, Omokanye, Olatinwo, Durowade, et.al, 2014). Furthermore, Mohammed et al (2013) also found out that the prevalence of anaemia was higher among grand multiparous women (85.3%), 66.5% of multiparous (para 2-4) and only 65.5% of all primigravida women had varying degrees of anaemia, showing that there was an inverse correlation between anaemia and parity (Mohammed and Emmanuel, 2013).However, this is contrary to studies that recorded highest rates of anaemia, and lowest knowledge scores among primigravidae.

Negative perceptions of the hematinics are also shown in the research findings as being a large part of why some women, although not most, do not use them. This study observed that pregnant women have a number of negative perceptions about hematinics and the consequences of these may affect utilization. However, majority of women respondents noted positive effects that it did have on their pregnancies despite not so positive perceptions of the characteristics of the drugs such as its smell as well as the belief that it may prompt nausea. Aziz *et al*. (2002) also focused on the negative perceptions and side effects of hematinics and Iron supplements, noting that contrary to the beliefs that pregnant women often stopped taking their drugs because of these perceptions or negative side effects, it was not always the case.

 In this study as well as Aziz et.al (2002) and Dinga (2013), perceptions and side effects could not be established as influencing adherence. Instead, as Dinga (2013) further notes, forgetfulness which is not covered in this study is a major reason given by most pregnant women for not adhering to taking all their drugs. This may of course again be linked to the fact that most pregnant women are not knowledgeable of the benefits and importance of hematinics for both the health of themselves and their unborn babies. In similar studies (Aikawa *et al*., 2006; Kalimbira *et al*., 2009; Dinga, 2013), a lot of women report hematinics as causing vomiting, having bad

taste and smells, and leading many to take hematinics with different food items in a bid to disguise their smells or tastes.

A study done in Ogun State, in Nigeria, identified that women would not utilize hematinics for a variety of reason, including but not limited to: cheap as well as easily accessible and more compassionate care and drugs from TBAs than from orthodox health workers, even when they are aware that complications could arise from TBA care (Kawungezi et. al, 2015). TBAs in many African nations remain an important source of social and cultural support to women, while due to economic constraints across the country, poor family support and inability to make decisions at home without spousal approval, cultural factors, religion, cost of drugs, distance to supply, peer influences, many fail to acquire and use hematinics (Ndyomugyenyi, Neema, and Magnussen, 1998). Husband's decision making is especially crucial as argued by many due to cultural issues in Africa.

In Nigeria, herbal medicine use in pregnancy is noted as being rampant. The use of herbal medicines among pregnant women as prompted by the cultural relevance, as well as availability and affordability of traditional remedies continues even in modern times. Studies among pregnant women attending ante-natal clinics in Nigeria have noted a wide spread use of herbal medicines of up to 67.5% among respondents (Fakeye, Adisa, Musa, 2009; Joseph, Ezie, Aya and Dapar, 2017).This study especially highlights factors such as distance to supply point (.003), cost of drugs (.004), poor family support (.028), and inability to make decisions at home (.036) as significantly associated and correlated to the use of hematinics. Titaley & Dibley (2015) highlighted that the main factors of not using hematinics among pregnant women were lack of knowledge, residence in the rural area, costs, low socioeconomic status and long travel distances from health care service points.

Oliver (1980) also notes that while quality is a key factor affecting customer satisfaction and increasing the expectations among those relying on the organization for some services. Several factors regarding hematinics affect its utilization, and although respondents were effusive largely in seeing the positives, however, most argued that it had some traits that they wished they could change. These are their perceptions of the hematinics, for instance that the drug is smelly, and induces nausea, while it may also prompt heartburn in users. Mahmoud et.al (2019) found that

patients' discrimination exists between three facets of health service quality by monitoring perceptions of health services, which in this case are hematinics.

Additionally, the willingness of the patients to utilize hematinics was measured by probing the existence of complications during pregnancy, the use of hematinics before pregnancy (72.1%), the checking of PCV during pregnancy, the consistent usage of hematinics during pregnancy, as well as the willingness to use hematinics during subsequent pregnancies. The findingsalso highlight correlations among indices such as the checking of pcv and use of hematinics, relationship between gestational age at use of hematinics, and the checking of PCV, and the correlation between education level and the willingness to have used hematinics even before pregnancy. This study also reported that women had poor practices regarding hematinics for example for not using them consistently, and some for not using prior to pregnancy. In a similar study by Ilmas (2018), none of the pregnant women had started taking hematinics before conception. This study as well as Ilmas (2018) also showed that women who started using hematinics during pregnancy, none of them took it regularly despite having positive attitudes (Vitale et al. 2009, PDHS 2012/13, Hisam et al. 2014, Nisar et al. 2014a, Ouedraogo et al. 2015). Ilmas' study reported that women stopped taking hematinics even without experiencing any side effects.

Hematinic usage while very crucial in pregnancy is largely dependent on a number of variables which include knowledge, social factors, perceptions and individual willingness to use, and without which the resolution of anaemia in pregnancy may go unresolved. In summary, Knowledge level of mothers of under-two in Ibadan North East Local Government Area, Oyo state about the use of hematinics is low with the mean knowledge score being 4.94.Knowledge scores are not significantly associated with any of the following variables: age, parity, knowledge preventing utilization, adherence to use during pregnancy, view as being necessary to purchase, stage of pregnancy at first use among others checked.

The factors influencing the choice of hematinics among mothers of under-two in Ibadan North East Local Government Area, Oyo stateinclude: poor family support, inability to make decisions at home, knowledge of hematinics gained,cultural factors,religion, financial constraints, cost of drugs, distance to supply, peer influence among others. Additionally, women's levels of education were noted as being significant too.

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Perceptions of mothers of under-two in Ibadan North East Local Government Area, Oyo state about hematinics are noted as including it being unnecessary to purchase hematinics, that constipation may be caused by hematinics usage, that hematinics are smelly, and that it may cause nausea. Perceptions however could not be established as influencing adherenceto hematinics utilization.

With regards to the willingness of mothers of under-two in using hematinics during their pregnancy phase in Ibadan North East Local Government Area, Oyo state, the resultsshowboth association and correlation between checking of pcv and use of hematinics showing how the checking of pcv may prompt a need and willingness among pregnant women to use hematinics. Also some respondents had used hematinics before pregnancy, and as such showed willingness to use it during pregnancy. Education was also shown to be significantly correlated.

## 5.2    Conclusions

The goal of this thesis research was to provide an assessment of the factors associated with the utilization of hematinics among mothers of Under-two in Ibadan North East Local Government Area of Oyo State. The rationale for this thesis is the observation of the high rates of maternal mortality during pregnancy due to anaemia in developing countries such as Nigeria, and the continuing high prevalence rates of anemia among pregnant women despite the intervention efforts of health care professionals in terms of hematinics recommendation and supply.

The results of this thesis provide some preliminary evidence that dealing with challenges revolving around the knowledge about hematinics, the factors uncovered, and the perceptions of hematinics may be effective in improving iron and folate status during pregnancy whilst also serving to reduce anemia during pregnancy by ensuring hematinics intake as well as high adherence.In line with the objectives of this study, the following conclusions can be drawn:

The adherence rate to hematinics was low among mothers of under-two in using hematinics during their pregnancy phase in Ibadan North East Local Government Area, Oyo state. Also, knowledge levels were not high among respondents.

Factors affecting adherence include:

Distance of residence to facility: Pregnant women residing closer to supply point are more likely to adhere probably due to the fact that they are able to access the major source for the hematinics.

Educational attainment: Women with higher levels of education are more likely to adhere.

Gestational age: Women in their third trimesters are more likely to adhere due to the fact that pregnant women start attending Antenatal clinic in their second trimester and may take time before commencing on any prescriptions made at the facility.

History of PCV: When the pregnant women perceive their health and that of the baby to be at risk, after checking their pcv, they are more likely to follow on any recommendations made by the health care professional.

Knowledge on importance of hematinics: As majority of pregnant women do not have much knowledge on hematinics and how it helps reduce the chances of anemia in pregnancy, adhering to usage instructions may be difficult.

## 5.3    Recommendations

The following recommendations are made on the basis of research objectives and pooled from the findings unearthed in this study:

- Health care professionals at the various levels of care and in different health facilities should endeavor to sensitize pregnant women on the need to continuously utilize and adhere to hematinic supplements throughout pregnancy. This continued sensitization in addition to a much-needed education on anemia in relation to pregnancy which should be done regularly amongst pregnant women will ensure that the pregnant women actually take the needed hematinics. Additionally, health care professionals should communicate to the pregnant women about hematinics in a way that is clear to them, noting the importance and types of hematinics. Pregnant women, their partners and significant others should also be sought out and further sensitized about the hematinic drugs that they need during pregnancies. These above-mentioned activities will improve knowledge levels of hematinics among pregnant women especially those who utilize government funded health facilities for ANC services and child-delivery.

- Additionally, it is recommended for government authorities to increase the public awareness about hematinics and their beneficial effects in pregnancy as well as, on the public health in general. This will positively affect perceptions of the general public about hematinics as well as that members of society help to ensure that factors inhibiting hematinics use are surmounted.

- Also, it is recommended herein that there should be increased governmental efforts regarding sensitization and advocacy targeting effecting changes inthe perceptions of family members and peersas these would be needed to form a sort of social support which would encourage and allow women in accessing and adhering to hematinics prescriptions prior to and during pregnancies.

- Sensitization of women at the community level to start antenatal clinics early, as well as on the importance of early supplementation with hematinics by health professionals should increase levels of willingness to utilize and adherence to utilization instructions among pregnant women.

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## QUESTIONNAIRE

**FACTORS ASSOCIATED WITH HEMATINICS UTILIZATION DURING PREGNANCY AMONG MOTHERS OF UNDER TWO YEARS IN IBADAN NORTH-EAST LOCAL GOVERNMENT AREA, OYO STATE.**

**Dear Ma,**

My name is **Okunrotifa Omolara**, and I am conducting a survey on the Factors that could be associated with the use of hematinics drugs among mothers of under-two in this LGA, as part of the requirement to graduate with Masters in Public Health degree in Health Promotion and Education from the University of Ibadan. You have been selected by chance among other participants. I would like to ask you some questions related to this study. Participation in this survey is voluntary and you can choose not to take. All information you will give will be confidential and will be used to make a general report. No names will be included in the report and there will be no way to identify you as one of the people who gave information. If you have any questions about the survey, feel free to ask me.

Do you mind if we proceed?  YES ☐  NO ☐  (Tickas appropriate)

**Okunrotifa Omolara**
Researcher

## SECTION A: SOCIO ECONOMIC AND DEMOGRAPHIC INFORMATION
**(Underline the options most applicable to you)**

1) Age: _____

2) Ethnicity (1). Yoruba (2). Hausa (3). Igbo (4) Others (Specify) _____

3) Highest level of education: (1). No formal education (2). Primary education (3). Secondary education (4). Islamiya (5). Quranic (6). Tertiary

4) Marital status: (1). Single (2). Married (3). Divorced (4). Separated (5) Cohabiting (6) Widowed

5) Occupation: (1). Unemployed (2) Housewife (3) Trading (4). Artisan (5). Civil Servant (6) Professional
6) Household monthly income: _____

7) Religion (1). Christianity (2). Islam (3). Traditional (4). Others (specify) _____

8) How many children have you given birth to (Parity)? _____

9) How old were you when you gave birth to your first child? _____

## SECTION B: KNOWLEDGE ON HEMATINICS UTILIZATION

10  Do you know what hematinics are?  1. YES ☐    2. No ☐

11. If yes, give examples

1.   Paracetamol ☐  2. Folic Acid ☐  3. Zinc ☐

4. Vit B12        ☐      5. Piritin      ☐        6. Flagyl      ☐

12. How did you know about these drugs? 1. Health professionals ☐ Friends ☐

☐            ☐ Relative      4. Media          5. Other (specify) _____

13. When you were pregnant did you use any Hematinics?  1. Yes  /  ☐. No ☐

14.  If yes, which of them did you use?

1. Iron (Fe) ☐ Folic acid      ☐ Vitamin B12      ☐ Zinc (Zn)  5. ☐ alt (Co) ☐

15. Do you know of any illness or disease condition that shortage of blood during pregnancy normally causes?        1. Yes      ☐. No ☐

16. If Yes, what are these diseases? 1. Albinism ☐ 2. Anaemia ☐ 3. Low birth weight ☐

17.  What are the causes of shortage of blood during pregnancy?

1. Lack of Iron ☐ 2. Inadequate nutrition ☐ 3. Stress ☐ 4. Non-utilization of folic acid ☐

5. Walking in the hot Sun ☐

18. Do you know what the consequence of this disease in pregnancy is? 1. Yes ☐ 2. No ☐

19. If you answered Yes to question 18, what is the consequence of the disease in pregnancy?_____

20. Where or from whom did you learn about this disease? 1. Community health worker ☐ 2.Health professional ☐ 3. Friend ☐ 4. Relative ☐ 5. Media ☐ 6.Other (specify) _____(You can select more than one option)

## SECTION C: FACTORS HINDERING AND FACTORS ASSOCIATED WITH COMPLIANCE OF HEMATINICS

21. Do you think your knowledge about hematinics could prevent you from utilizing hematinics? 1. YES  2 ☐      NO      ☐

22. Do you think religious factors could prevent you from utilizing hematinics? 1.YES ☐ 2. NO ☐

23. Do you think cultural factors could prevent you from utilizing hematinics? 1. YES ☐ 2. NO ☐

24. Do you think financial constraints at home could prevent you from utilizing hematinics?

1. YES ☐ 2. NO ☐

25. Do you think distance from hematinics supply could prevent you from utilizing hematinics?

1. YES  ☐  2. NO ☐

26. Do you think cost of hematinics could prevent you from utilizing hematinics?

1. YES2. O      ☐

27. Do you think poor family support could prevent you from utilizing hematinics?

1. YES ☐ 2. NO ☐

28. Do you think peer influence could prevent you from utilizing hematinics? 1. YES ☐ 2. NO ☐

29. Do you think low decision-making authority at home could prevent you from utilizing hematinics? 1. YES ☐ NO      ☐

30. Do you think TBA influence in your community could prevent you from utilizing hematinics? 1. YES      ☐    2. NO ☐

31. Other factors which could prevent you from utilizing hematinics(specify)…………………………..

## SECTION D: PERCEPTIONS ABOUT HEMATINICS

Tick the option that best applies to you of the three available for each question.

A = Agree; U = Undecided; D = Disagree

| S/N | STATEMENTS | A | U | D |
|-----|------------|---|---|---|
| 32. | Pregnant women's opinions regarding the Hematinics tablets were positive | | | |
| 33. | Pregnant women relatives would prefer them using herbs to hematinics | | | |
| 34. | Hematinics are always smelly | | | |
| 35. | Hematinics usually makes one feel nauseated | | | |
| 36. | Taking hematinics causes heartburns | | | |
| 37. | Taking hematinics causesconstipations | | | |
| 38. | Taking hematinics causesdiarrhea | | | |
| 39. | I felt hematinics were unnecessary for me to purchase | | | |

## SECTION E: WILLINGNESS TO USE HEMATINICS

40.Have you ever had any complications during pregnancy? 1. YES ☐ 2. NO ☐

41. If Yes to Question 41, what type of complication? (You can select more than one option)
(1) Miscarriage ☐ (2) Still Birth ☐ (3) Abortion ☐ (4) Others (Specify)…………………..

42. Did you at any time use Hematinics before you became pregnant? 1. YES ☐ 2. NO ☐

43. If Yes to Question 43 above, did you use it as supplement to diet or prescribed as medicine?
1. Medicine ☐ 2. Supplement to diet ☐ 3. None of the above ☐

44. What was your source for the tablets or syrup? (You can select more than one option)
1. Public hospital pharmacy ☐ Private hospital pharmacy 3. ☐ vate owned Pharmacy 4. ☐ Patent Medicine Store (Chemist) ☐

45. At what stage of your pregnancy did you begin hematics use? 1. First trimes ☐ 2. Second trimester ☐ 3. Third trimester ☐

46. Did you always check your PCV when you were pregnant? 1. YES ☐ 2. NO ☐

47. Did you faithfully take the given hematinics when you were pregnant? 1. YES ☐ 2. NO ☐

48. If you get pregnant again would you use hematinics? 1. Yes ☐ 2. No ☐ 3. Unsure ☐

Reason for response:

_____

_____

_____

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