UNIVERSITY FOR DEVELOPMENT STUDIES

THE RELATIONSHIP BETWEEN ADEQUATE PRENATAL CARE AND THE ADOPTION OF ESSENTIAL NEWBORN CARE PRACTICES IN THE KASSENA-NANKANA MUNICIPALITY OF GHANA

LAWAL ALHASSAN

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BY

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(UDS/CHD/0069/12)

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FEBRUARY, 2017

DECLARATION

STUDENT

I hereby declare that, this thesis is as a result of my own efforts and that it has never been submitted anywhere either in part or whole for the award of any degree.

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ABSTRACT

Poor new-born care practices are contributing to infant deaths especially during the neonatal period. Antenatal care is a key strategy used by the Ghana Health Service to improve new-born survival through the promotion of new born care practices (safe cord care, optimal thermal care and good neonatal) feeding) among expectant mothers. However, very little is known in the Kassena-Nankana municipality about the contribution of adequate antenatal care utilization to the adoption of new-born care practices by caregivers.

A community based analytic cross-sectional study design was employed in the study. Thirty (30) clusters were generated using probability proportionate to size (PPS) sampling methodology and systematic random sampling used to select 634 households where one year postpartum women were interviewed using a semi structured questionnaire.

Results from the study revealed that only 37 (6.2 %) of respondents were judged to have had safe cord care, 214 (35.7%) had optimal thermal care, and 398 (66.3%) were considered to have had adequate neonatal feeding. Multivariable logistic regression analysis showed that women who delivered in a health facility were 93 % less likely (AOR=0. 07 [CI: 0.03, 0.14]) to practice safe cord care but 33.2 times more likely (AOR=33. 17 [CI: 8.08, 136.10]) to give optimal thermal care to their babies.

In conclusion, adequacy of prenatal care utilization in the study area was significantly associated with only good neonatal feeding practices but not safe cord care and optimal thermal care, suggestive of the fact that, antenatal care counselling package lack key messages on cord care and optimal thermal care practices.

Ghana Health Service should therefore integrate key messages on new-born care practices into the routine ANC services in the municipality to raise the knowledge and possible adoption of these practices at home by caregivers.

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DEDICATION

This work is dedicated to my mum and late son (Farid).

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LIST OF ABBREVIATIONS

ANC	Antenatal Care
AOR	Adjusted Odds Ratio
ATR	African Traditional Religion
BCG	Bacille Calmette-Guérin
BPACR	Birth Preparedness and Complication Readiness
CHAG	Christian Health Association of Ghana
CI	Confidence Interval
CHPS	Community Health Planning and Services
DPT	Diphtheria-Polio-Tetanus Immunization
ENA	Essential Nutrition Action
GDHS	Ghana Demographic and Health Survey
GHS	Ghana Health Service
HoD	Head of Department
IYCF	Infant and Young Child Feeding
LIC	Low Income Countries
JHS	Junior High School
MDG	Millennium Development Goals
MICS	Multi-Indicator Cluster Survey
NMR	Neonatal Mortality Rate
NSS	Nutrition Surveillance System
PPS	Probability Proportional to Size
SBA	Skilled Birth Attendant
SHS	Senior High School
SPSS	Statistical Software for Social Scientists
TIBF	Timely Initiation of Breastfeeding Rate
UNICEF	United Nation Children Fund
WHO	World Health Organization

OPERATIONAL DEFINITION OF KEY TERMS

Neonatal mortality: the probability of dying within the first month of life

Adequate Antenatal Care: A pregnant woman initiating first antenatal care (ANC) in the first trimester and making at least four ANC visits

Essential New born care practices: a wide ranging interventional strategy designed and developed by the World Health Organization (WHO) with the aim to improve new-born's health. It is administered before conception, during pregnancy and delivery, after birth as well as during the postnatal period. These practices include, clean cord care, optimal thermal care and good neonatal feeding practices.

Optimal Thermal Care: Wrapping a baby within 10 minutes of birth plus baby being dried/ wiped immediately after birth and first bath delayed beyond 6 hours

Safe cord care: Use of a clean cutting instrument to cut the umbilical cord, tying the cord with a clean thread and applying no substance to the cord stump

Good neonatal feeding practices: Initiating breastfeeding within the first one hour after birth, giving no pre-lacteal and feeding the child with colostrum.

CHAPTER ONE

INTRODUCTION

1.0 Background

Neonatal mortality or death is one of the major causes of concern with new-borns all over the world, especially developing and under developed countries. Despite some remarkable improvements in neonatal health in recent years, the high mortality rates remain unchanged in many countries. Of the 10 million babies born every year, approximately 4 million infants die during first week, 8 million during first year and around 10 million within 5 years of their life. Two-thirds (99%) of these deaths occur in the third world or developing countries, Asia and Africa (Adersh, 2011).

According to Baiju and Laxmi (2013), there has been a considerable decline in under-five and infant mortality globally during last four decades. However, neonatal mortality rates remain unchanged especially in developing countries. It is estimated that each year around four million neonatal deaths occur almost exclusively in low income countries. In these countries, progress towards achieving Millennium Development Goal 4 is being hampered by slow progress in reducing the number of neonatal deaths. The neonatal period (the first 4 weeks of life after birth) is only $1/60^{th}$ of the first five years of life, but contributes 38% of the estimated 10.5 million under-five deaths occurring every year all over the world

Waldermar et al., (2010) also indicated that, approximately 38% of deaths among children under-five years of age occur during the first 28 days of life, and 75% of the neonatal deaths occur within the first 7 days. In Ghana, infant mortality is estimated at 53 deaths per 1000 live births out of which 60% of the deaths occur within the first 28 days of a child's live (UNICEF MICS, 2011).

Without a major reduction in neonatal deaths in the first 7 days after birth, achievement of the United Nations' Millennium Development Goal 4 which aims at reducing mortality by

two thirds among children less than five (5) years by 2015 is unlikely to be realized (Waldermar et al., 2010).

There are many causes of neonatal deaths. Complications during pregnancy, poor health condition of mother, lack of proper care during pregnancy, filthy conditions during delivery, critical conditions after birth and improper new-born care are some of the major causes of neonatal mortality. Children also die due to premature birth, severe malformation, obstetric complications, or because of infections caused by harmful practices at home. Even though it is not scientifically proved, low birth weight is also one of the causes of neonatal death (Adersh, 2011).

According to Waldermar et al., (2010) and the National Assessment for Emergency Obstetric and New-born care report (2011), the primary causes of new-born deaths include Infections, Asphyxia, Pre-maturity and Low Birth Weight. Infections are the major cause of infant mortality after one week of birth. Infants get infected either from hospitals due to various complications or from the home. The later one is the main reason of infection in many countries. There are many ways an infant acquires infection at home. Unhygienic environment conditions, improper cord care practices, poor feeding practices etc can cause infections like sepsis, tetanus, diarrhoea etc., to infants leading to death (Adersh, 2011). Diagnostic grouping of neonatal mortality however varies from country to country depending on the level of social and economic development, the quality of health services, the environmental circumstances and cultural practices (WHO, 2002).

According to the WHO (2002) neonatal and peri-natal mortality usually decline more slowly than infant mortality because infant deaths after the neonatal period are more sensitive to general social changes and more easily affected by preventive activities and

appropriate case management. Additionally, more efforts have been made to decrease the post-neonatal components of infant mortality

There are a number of interventions for essential new-born care practice and all of them are important and should be practiced in a proper way for better results. It includes prevention of infection through clean delivery and hygienic cord care, thermal protection by keeping the baby warmth, ensuring proper breathing and resuscitation methods, early and exclusive breast feedings, immunization, treatment of new-born illness, eye care practices, and providing special care to immature and low birth weight infants (Adersh, 2011). Failure to implement these basic preventive measures may be contributing to the deaths of neonates in communities. It is therefore critical that prevailing risky new-born care practices are identified and measures taken to address them.

One key intervention that health authorities use to address this problem is antenatal care (ANC) during pregnancy. In an attempt to achieve Millennium Development Goal four (MDG4), it is important for mothers to adopt essential new-born care practices which are aimed at reducing neonatal morbidity and mortality. Essential new-born care is a wide ranging interventional strategy designed and developed with the aim to improve new-born's health. It is administered before conception, during pregnancy and delivery, after birth as well as during the postnatal period. Clean cord care, optimal thermal care and good neonatal feeding practices are defined as essential new-born care practices (Saaka and Iddrisu, 2014).

Adersh, (2011) indicated that, there are three major components of an essential new-born care programme. The first component focuses on basic antenatal or pregnancy care, labour or delivery care and postnatal care. The second component is on early detection of the dangerous signs and symptoms or problems and consultation of medical practitioners

whiles the final component is on adequate treatment given to the new-borns for various conditions, such as birth asphyxia, sepsis etc.

Every human should get these facilities irrespective of their socio-economical status in order to reduce the mortality rates and improve the health of new-borns (Adersh, 2011).

Antenatal care (ANC) remains one of the Safe Motherhood interventions that if properly implemented has the potential to significantly reduce maternal and neonatal mortalities. The antenatal period presents opportunities for reaching pregnant women with interventions to maximize maternal and neonatal health (Asundep et al., 2013). Appropriate antenatal care is important in identifying and mitigating risk factors in pregnancy but many mothers in the developing world including Ghana do not receive such care (Magadi et al., 2000).

In Ghana, 97.3% of pregnant women receive antenatal care at least once from a skilled provider out of which 87.3% of the women made at least four ANC visits before putting to birth (GDHS, 2014). However, in the Kassena-Nankana Municipality, slightly above half (56.7%) of the women have access to ante natal care from a skilled provider out of which 79.7% of them had 4+ ANC visits (KNMHD,2015)

One would expect that, a high ANC coverage and 4+ ANC visits should translate in a corresponding increase in enhanced new-born care practices and ultimately a reduction in infant and neonatal mortality especially at the community levels. However, Zanconato et al., (2006) argues that, despite the high proportion of women receiving antenatal care in developing countries, the quality of prenatal care is still leaves much to be desired.

Neonatal mortality in the Kassena-Nankana Municipality still remains high and currently estimated at 19 deaths per 1000 live births (KNMHD, 2015).

Very little information is available in the Kassena-Nankana municipality on the contribution of ANC to new-born deaths and neonatal care practices particularly at the community level. This study therefore seeks to investigate the effect of prenatal care on the adoption of new-born care practices among nursing mothers in the Kassena-Nankana Municipality of the Upper East Region of Ghana.

1.1 Problem Statement

The strategy to improve the health and enhance new-born survival is an important component of maternal and child health. The strategy to reduce neonatal morbidity and mortality entails the adoption of new-born care practices such as clean cord care, optimal thermal care and good neonatal feeding practices. In ability to implement these preventive measures may be contributing to the deaths of neonates in communities.

Adequate antenatal care (early initiation of ANC and making at least four ANC visits) during pregnancy is one key intervention that has been used over the years by health authorities to identify and prevent risk factors during and after pregnancy through regular assessment, counselling and provision of essential services to the expectant mother.

Though ANC is a key strategy used by the Ghana Health Service and other partners for informing and preparing expectant mothers to correctly care for their newborns and also avert complications, very little is known in the study area about the contribution of adequate ANC utilization to the adoption of essential newborn care practices by caregivers.

This study therefore sought to investigate the effect of prenatal care on adoption of new-born care practices among nursing mothers in the Kassena-Nankana Municipality of the Upper East Region of Ghana.

1.2 Hypothesis

Null Hypothesis: Adequate prenatal care utilization does not influence the adoption of essential new-born care practices among mothers of infants.

Alternate Hypothesis: Adequate prenatal care utilization influences the adoption of essential new born care practices among mothers of infants.

1.3 Research Questions

i. What is the prevalence of essential new born practices as recommended by the WHO in the Kassena-Nankana Municipality?

ii. Does adequate antenatal attendance influence infant and young child feeding practices in the Municipality?

iii. What factors predict adoption of healthy essential new-born care practices in the Kassena-Nankana Municipality?

iv. Do mothers in the Municipality have adequate knowledge on new born danger signs?

v. What is the contribution of adequate prenatal care to the adoption of essential new-born care practices in the Municipality?

1.4 Aim and objectives of the study

The aim of this study was to determine the relationship between adequate prenatal care and the adoption of essential new born care practices in the Kassena-Nankana Municipality.

The specific objectives were:

i. To determine the prevalence of essential new born practices as recommended by the WHO in the Kassena-Nankana Municipality
ii. To determine the relationship of adequacy of antenatal attendance and infant and young child feeding practices in the Kassena-Nankana Municipality
iii. To identify factors that predict adoption of healthy essential new-born care practices in the Kassena-Nankana Municipality?
iv. To evaluate maternal knowledge on new born danger signs in the Kassena-Nankana Municipality.
v. To assess the independent contribution of adequate prenatal care to the adoption of essential new born care practices in the Kassena-Nankana Municipality.

1.5 Conceptual Framework

Figure 1.1 is a conceptual framework indicating the influence of adequate prenatal care on the adoption of new-born care practices by caregivers. Socio-demographic characteristics such as age of mother, educational status and wealth index of the mother would influence the mothers decision to seek and utilize ANC services.

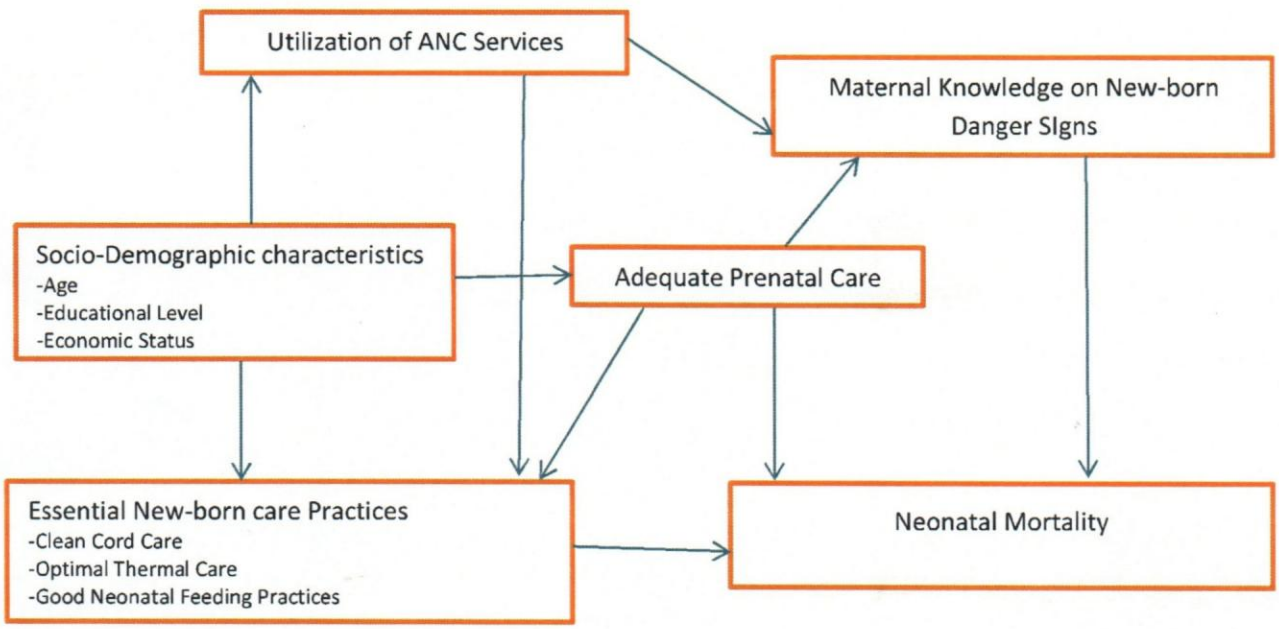
Maternal knowledge on new-born danger signs is greatly influenced by whether a mother attains adequate prenatal care or not prior to delivery. During antenatal care sessions, women are usually educated on new-born dangers signs and what to do when any of the danger signs are noticed. Women who therefore have adequate antenatal care during

pregnancy are expected to be more knowledgeable on new-born danger signs than those who do not have adequate antenatal care during pregnancy.

Adoption of essential new-born care practices such as clean cord care, optimal thermal care and good neonatal feeding is positively influenced by adequacy of antenatal care utilization during pregnancy. Antenatal care counseling packages prepares the expectant mothers on healthy new-born care practices that extend beyond the facility level to the household level.

Finally, adequate prenatal care, improved maternal knowledge on new-born danger signs and improved new-born care practices by caregivers at home would largely lead to reduced neonatal deaths especially at the community levels.

Figure 1.1: Conceptual Framework



Source: Author's Construct, 2015

1.6 Significance of Study

Although several studies have been conducted on antenatal care and new-born care practices both globally and locally, none or very little has been done to assess the relationship between adequate prenatal care and the adoption of essential new-born care practices in the study area. Therefore information provided could serve as baseline information for further research and intervention.

Findings from the study would also inform policy makers in Ghana on whether the counseling package at ANC sessions provides adequate information on new-born care practices or a review of the counselling package is necessary.

Findings of the study will also be relevant to non-governmental organizations and other civil society organizations with information on areas of maternal and child health to support.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter outlines a review of relevant literature related to the study both globally and locally. The ultimate purpose is to unravel what has already been done about the study topic and identify gaps that need to be addressed.

2.1 Neonatal Mortality

Neonatal mortality still remains high in the wake of declining child mortality. Suboptimal new-born care practices are predisposing factors to neonatal mortality (Ayiasi et al., 2014). Annually, there are approximately four million neonatal deaths and 3.2 million stillbirths' worldwide (Lawn et al, 2008), 99% of these deaths occur in low and middle income countries out of which about 50% occur at home (Lawn et al., 2008). Approximately 40% of deaths among children under-five years of age occur during the first 28 days of life (Lawn et al., 2008) and 75% of the neonatal deaths occur within the first 7 days (Waldermar et al., 2010). During the first month of life, the child's risk of death is nearly 15 times greater than at any other time before his or her first birth (UNICEF, 2004).

According to WHO (2002), between 40 and 60 percent of infant mortality occurs in the first four weeks of life in many countries, majority of which occur during the first week. This relationship, however, varies greatly depending on the level of social and economic development of a country and on the coverage and quality of its health services. Unlike infant and under five mortality rates, reductions in neonatal mortality have been less in the developing countries ((UNICEF, 2004).

Generally, the neonatal mortality rate (NMR) in sub-Saharan Africa is estimated to range from 20 to 40 per 1000 live births (Greenwood, 2003). Without a major reduction in neonatal deaths in the first 7 days after birth, achievement of the United Nations'

Millennium Development Goal 4; a reduction in mortality by two thirds among children younger than 5 years of age- is unlikely to be realized (Waldermar et al., 2010).

According to the recent 2014 Ghana Demographic and Health Survey report, infant mortality in Ghana is estimated at 41 deaths per 1000 live births of which about 71 percent (29/1000) of the deaths occur within first one month of life. Results of the 2011 Multiple Indicator Cluster Survey (MICS) also estimates infant mortality in Ghana to be 53 deaths per 1000 live births out of which 60% of the deaths occur within the first 28 days of a child's live. Infant mortality in the upper east region is higher (46 deaths per 1000 live births) than the national rate out of which more than half (52.1%) of the deaths occur within the first month (GDHS, 2014).

An examination of the 2014 GDHS and the 2011 MICS report shows a decline in the infant mortality rate in the country even though much reduction in infant deaths is still required. Usually neonatal and perinatal mortality decline more slowly than infant mortality. There are

two main reasons for this: the first is that, infant deaths after the neonatal period are more sensitive to general social changes and more easily affected by preventive activities and appropriate case management; the second is that more efforts have been made to decrease the post-neonatal components of infant mortality.

2.1.1 Causes of Neonatal Mortality and Morbidity

The causes of neonatal deaths and morbidity are generally poorly documented especially in developing countries. Aside, the lack of diagnostic facilities, there is the difficulty in identifying the cause of death in new-borns because many factors may be contributing to the deaths (WHO, 2002). New-born care often receives less-than optimum attention. Although over the past 25 years, child survival programs have helped to reduce the death

rate among children under age 5, the biggest impact has been on reducing mortality from diseases that affect infants and children more than 1 month old (Adersh, 2011).

According to UNICEF (2004), most of the neonatal deaths can be prevented with cost-effective solutions that do not depend on highly trained provider or sophisticated equipment. Good nutrition and hygiene are the panacea in many cases.

Several factors have been ascribed both globally and locally as contributing to the deaths of newborns and with some of the deaths occurring as a result of practices at both health facilities and at the household levels.

Asphyxia, Pre-maturity obstetric complications, Low Birth Weight and infections caused by harmful practices at home are some of the causes of neonatal mortality (Waldermar et al., 2010; Adersh, 2011; and NAEON, 2011).

According to WHO (2011), the three major causes of neonatal deaths worldwide are infections (36%, which includes sepsis/pneumonia, tetanus and diarrhoea), pre-term (28%), and birth asphyxia (23%). However, there is some variation between countries depending on their care configurations.

Complications during pregnancy, poor health condition of mother, lack of proper care during pregnancy, filthy conditions during delivery, critical conditions after birth and improper new-born care are other major causes of neonatal mortality (Adersh, 2011).

2.1.1.1 ***Infections***

Infection remains a major cause of illness and death in the neonatal period (Salaam et al., 2014). Early onset of bacterial infection is an important cause of morbidity and mortality in newborn infants after one week of birth. Infants usually get infected either from hospitals due to various complications or at home. The latter one is the main reason of

infection in many countries. New-borns can acquire infection at home through unhygienic environment conditions, improper cord care practices, poor feeding practices etc. This can cause infections like sepsis, tetanus, meningitis and diarrhoea to infants leading to death (WHO, 2002; Adersh, 2011).

The relative contribution of SBI to overall neonatal mortality varies greatly across countries, ranging from less than 5% in the most developed countries to over 30% in developing countries. Institutional deliveries, the percentage of LBW babies and the quality of care during and after delivery including practices at the nursery, early breastfeeding, Asphyxia and hypothermia are the major factors influencing the risk of dying from infection in the neonatal period (WHO, 2002).

2.1.1.2 Hypothermia

Hypothermia, defined as body temperature below 36.5°C, is a frequent finding in new-born babies, particularly in LBW babies, who are at increased to risk of becoming hypothermic because of an inadequate thermo regulation and of insufficient awareness of this problem among health professionals (WHO, 2002). When an infant is challenged by cold, the baby attempts to conserve body heat by vasoconstriction and to maintain body temperature via thermogenesis by the metabolism of brown adipose tissue and an increase in oxygen consumption. The increase in energy expenditure may reduce weight gain (Salaam et al., 2014).

Hypothermia is one of the primary causes of some neonatal deaths but most often than not, it is usually not considered among the direct causes of neonatal deaths. Several studies have revealed that even small departures from the optimal range for neonatal body temperatures are detrimental to health, especially in LBW babies. Even smaller degrees of

hypothermia below the optimal range have an adverse effect upon essential bodily functions such as oxygen consumption and acid-base equilibrium (WHO, 2002).

Hypothermia is also a risk factor for intra-ventricular haemorrhage in preterm and low-birth-weight infants and appears to be a risk factor associated with neonatal pneumonia.

Barriers to heat loss applied to any part of the body of the preterm and/or low birth weight (LBW) infant within 10 minutes after birth as well as the initiation of external heat sources (non-routine) such as skin-to-skin care within 10 minutes after birth are some measures that can help in the maintenance of body temperature for infants (Salaam et al., 2014).

2.1.1.3 Birth Asphyxia

Birth asphyxia from a practical point of view can be defined as failure to establish a normal respiration at birth due to impaired oxygenation during labour and delivery. Fetal and neonatal asphyxia is one of the most common causes of perinatal, neonatal and infant mortality and morbidity (WHO, 2002).

According to WHO (2002), difficulties in ascertaining the severity and duration of asphyxia and lack of follow-up have precluded a precise assessment of the extent and distribution of birth asphyxia and its outcome in many countries. Current estimates show that, nearly 840 000 newborns out of four million who suffer moderate-to-severe birth asphyxia die each year in the world.

It can be estimated that the percentage of neonatal deaths attributable to asphyxia range from 15% to 40%. Actually, all these figures may be underestimated, since current criteria (Apgar score) for the assessment of birth asphyxia are usually nonspecific and their predictive value is low (WHO, 2002).

2.1.1.4 Low Birth Weight (LBW)

A low weight at birth may be the result of a preterm delivery (preterm infants) or intrauterine growth retardation (small for gestational age infants). Preterm birth is the most important direct cause of neonatal mortality and it accounts for an estimated 27% of the four million neonatal deaths every year (Salaam et al., 2014).

The risk of dying during the neonatal period of LBW infants and particularly of VLBW babies – is much higher than the risk of normal weight infants because the former are highly exposed to birth asphyxia, trauma, hypothermia, hypoglycaemia, respiratory disorders and infections (WHO, 2002).

The percentage of neonatal deaths due to LBW varies depending on the quality of care available and the prevalence of LBW. Generally, the better the quality of neonatal care the higher the proportion of death attributable to LBW. In the most developed countries from 30 to 50% of neonatal death are caused by LBW but in these cases the mortality is confined to the extremely premature babies (WHO, 2002).

WHO (2002), reports that LBW infants have also a greater risk of dying in the post-neonatal period, from diarrhoea diseases and acute respiratory infections as compared to full-term infants. They probably account for over 20% of infant deaths. The relative impact of various factors is quite different in developed and developing countries, with malnutrition and diseases during pregnancy being the major cause of LBW in developing countries and heavy smoking during pregnancy being the most important single determinant of LBW in developed countries.

From the discussion so far, it is clear that infection which is a major cause of new-born deaths could be reduced greatly if preventive measures such as the adoption of basic new-born care practices especially at home are adhered to. However, mothers can only adhere

to new-born care practices only when they receive information on them. Ghana Health Service and other stakeholders have taken advantage of the antenatal care sessions during which mothers are counselled on various topics in order to translate into better child birth outcomes and also improve on new-born survival.

It is therefore imperative to investigate the extent to which antenatal care actually contribute to the adoption of new-born care practices by caregivers at the community level and hence contributing to the reduction of neonatal mortality in Ghana and the study area.

2.2 Prevalence and determinants of essential new born practices

The coverage of essential new born practices as recommended by the World Health Organization (WHO) is generally low among women though these recommended practices are critical for the survival of the new-born. Interventions that promote essential new-born care practices are important and should be practiced in a proper way for better results. It includes prevention of infection through clean delivery and hygienic cord care, thermal protection by keeping the baby warmth, ensuring proper breathing and resuscitation methods, early and exclusive breast feedings, immunization, treatment of new-born illness, eye care practices, and providing special care to immature and low birth weight infants (Adersh, 2011).

Failure to implement these basic preventive measures may be contributing to the deaths of neonates in communities. It is therefore critical that prevailing risky new-born care practices are identified and measures taken to address them.

In an attempt to achieve Millennium Development Goal four, it is important for mothers to adopt essential new-born care practices which are aimed at reducing neonatal morbidity and mortality. Essential new-born care is a wide ranging interventional strategy designed and developed with the aim to improve new-born's health and it is administered before

conception, during pregnancy and delivery, after birth as well as during the postnatal period. Essential new born care practices involve clean cord care, thermal care (keeping baby warm by wrapping in clean and dry clothes and delaying bathing until 24 hours after birth) and initiating breastfeeding within the first hour of birth.

According to Adersh (2011), an essential new-born care programme comprises three major components. The first component focuses on basic antenatal or pregnancy care, labour or delivery care and postnatal care. The second component is on early detection of the dangerous signs and symptoms or problems and consultation of medical practitioners whiles the final component is on adequate treatment given to the new-borns for various conditions, such as birth asphyxia, sepsis etc.

Every child should get these facilities irrespective of their socio-economical status in order to reduce the mortality rates and improve the health of new-borns (Adersh, 2011).

An optimal thermal environment is desirable for preterm infants. When an infant is challenged by cold, the baby attempts to conserve body heat by vasoconstriction and to maintain body temperature via thermogenesis by the metabolism of brown adipose tissue and an increase in oxygen consumption. The increase in energy expenditure may reduce weight gain (Salam et al., 2014). Optimal thermal care according to the World Health Organization (WHO) entails wrapping new-borns within 10 minutes of birth and delaying the first bath after 6 or more hours after birth.

Moreover, an umbilical cord infection may be clinically obvious while sometime tracking of bacteria along the umbilical vessels might not be apparent but can lead to septicemia, or other focal infections such as septic arthritis as a result of blood-borne spread. In such cases, affected babies may also present with fever, lethargy or poor feeding. Soon after a normal delivery, the skin of the new-born baby including the umbilical stump is colonized

mainly by nonpathogenic bacteria such as coagulase negative Staphylococci and Diphtheria bacilli. Pathogenic bacteria such as Coliforms and Streptococci may also be present on the skin and can track up the umbilical stump causing infection. It is therefore essential to keep the cord clean (Salam et al., 2014).

Good neonatal feeding on the other hand entails initiating breastfeeding within the first one hour after birth, giving no prelacteals and also feeding colostrum to the baby.

Several studies have been carried out globally and locally to assess the prevalence of essential new-born care practices and its contribution to improving new-born survival and hence reduction of neonatal and infant mortality

A community-based cross-sectional study among lactating women in Masindi, Uganda by Ayiasi et al., (2014) showed suboptimal new-born care practices. Only 23.7% and 6.1% of the women assessed practiced safe cord care and optimal thermal care respectively. 71.6% of the women applied potentially harmful substances to the cord and 87.9% of the women bathed their children early (within six hours of birth).

Waiswa and colleagues (2010) in their study in eastern Uganda, reported that, there is very low levels of coverage of new-born care practices among both the poorest and the least poor. Only 38% of the new-borns were judged to have had good cord care, 42% optimal thermal care, and 57% were considered to have had adequate neonatal feeding. Mothers were putting powder on the cord; using a bottle to feed the baby; and mixing/replacing breast milk with various substitutes.

A study by Rahi et al., (2006) in an urban slum of Delhi revealed that bathing the baby immediately after birth was commonly practiced in 82.6% of home deliveries. Use of clip, band or sterile thread to tie the cord and no application to the cord was significantly higher in institutional deliveries. 86.1% and 68% of the babies born at the institution and home

respectively had nothing applied to their cord. Nearly 1/3rd (29.3%) of all new-borns were not given colostrums.

Fikree et al., (2005) in their study in Pakistan also observed poor essential new-born care practices. Results from the study showed that majority of the women (44.8%) reported giving lacteals; colostrum (41.7%) or animal/formula milk (3.1%), as the first feed. New-borns were bathed immediately (82.1%) after delivery. Risky feeding practices such as giving prelacteals (55.0%) or supplementary feeds (71.3%), or delaying first feed (30.9%) were common. During the neonatal period, breast milk was the preferred feed (98.6%); however, honey (28.7%) and water (11.8%) were also given in order to 'reduce colic' or 'act as a laxative', which were perceived health benefits mentioned by mothers and traditional birth attendants.

A study by Osrin et al., (2002) in Nepal revealed poor essential new-born care practices. Only 64% of the new-born infants had been wrapped within half an hour of birth and 92% had been bathed within the first hour. The study further revealed that neonatal feeding practices were optimal. About 99% of babies were breast fed and practices with respect to colostrum and prelacteals were also good.

A similar study by Saaka, & Iddrisu (2014) in northern Ghana observed very low prevalence of essential new-born care practices especially on safe cord care and optimal thermal care. Only 0.2% had safe cord care, 5.2% optimal thermal care, and 50.2% were considered to have had adequate neonatal feeding.

Several studies conducted on new-born care have identified factors that predict the adoption of essential new-born care practices. A study by Saaka & Iddrisu (2014) observed that, the main predictors of good neonatal feeding were maternal age, timing of the first antenatal care (ANC), and maternal knowledge of new-born danger signs. Women

who could mention at least 4 danger signs of the neonate were 4 times more likely to give good neonatal feeding to their babies. Waiswa, et al., (2010) in their study in eastern Uganda also identified that multiparous mothers were less likely to have safe cord practices. The study however observed no association between socio-economic status and place of birth with any of the essential new-born care practices.

A related study carried out in Pakistan by Fikree et al., (2005), observed ethnicity and birth attendant at delivery as strong predictors for women who gave prelacteals.

Ayiasi (2014) in his study among lactating women in Masindi, Uganda observed no significant association between four/more ANC consultations and safe cord care and optimal thermal care. Also, secondary or higher education was associated with complete cord care. Women who reported health facility delivery were more likely to report complete thermal care but not complete cord care.

2.3 Antenatal care and its effect on new-born care practices

Antenatal care (ANC) remains one of the Safe Motherhood interventions that if properly implemented has the potential to significantly reduce maternal and neonatal mortalities. The antenatal period presents opportunities for reaching pregnant women with interventions to maximize maternal and neonatal health (Asundep et al., 2013). Appropriate antenatal care is important in identifying and mitigating risk factors in pregnancy but many mothers in the developing world do not receive such care (Magadi et al., 2000). Zanconato et al., (2006) however argues that despite the high proportion of women receiving antenatal care in developing countries, the quality of prenatal care is still leaves much to be desired.

During the antenatal care period, expectant mothers are usually expected to receive a number of services including counselling and health education on various topics including

essential new-born care practices. This means that antenatal care prepares the expectant mother to be well informed and knowledgeable on key infant caring practices and hence translating into better new-born survival.

However, has antenatal care over the years resulted into improved infant caring practices as expected? Some studies have been conducted to establish the effect of antenatal care on new-born care practices.

A study by Waiswa and colleagues (2010) in eastern Uganda showed no significant association between antenatal care and the adoption of essential new-born care practices such as optimal thermal care and good neonatal feeding practices. In Masinda, Uganda, Ayiasi, et al., (2014) also established from their study no significant association between adequate ANC attendance (at least four ANC visits) and complete cord care and optimal thermal care.

In northern Ghana, Saaka and Iddrisu (2014) also established from their study that timing of the first ANC is a good predictor of good neonatal feeding.

2.4 Utilization of Antenatal Care Services

The 2014 GDHS results show that Ninety Seven percent (97%) of women who gave birth in the five years preceding the survey received antenatal care from a skilled provider at least once for their last birth. Almost nine in ten women (87%) had four or more ANC visits. Urban women are slightly more likely than rural women to have received ANC from a skilled provider (99% and 96%, respectively) and notably more likely to have had four or more ANC visits (93% and 82%, respectively) (GDHS, 2014).

Adequacy of antenatal care is usually measured by taking into consideration a pregnant woman initiating first ANC in the first trimester and making at least four ANC visits.

Prenatal care has long been endorsed as a means to identify mothers at risk of delivering a preterm or growth-retarded infant and to provide an array of available medical, nutritional, and educational interventions intended to reduce the determinants and incidence of low birth weight and other adverse pregnancy conditions and outcomes (Alexander & Korenbrot, 1995).

Though antenatal care is a key strategy for reducing maternal mortality, millions of women in developing countries still do not receive it (Simkhada et al., 2008). In developed countries, 98% of all women receive prenatal care and 94% give birth under the supervision of skilled healthcare practitioners with timely access to appropriate emergency treatment if complications arise. In contrast, large numbers of pregnant women in Africa and Asia do not receive adequate prenatal care and lack skilled attendance at birth (Zanconato, Msolomba, Guarenti & Franchi, 2006)

In terms of global coverage, ANC is a success story. Currently, 71 percent of women worldwide receive any ANC; in industrialised countries, more than 95 percent of pregnant women have access to ANC (Lincetto et al., 2006). In sub-Saharan Africa, 69 percent of pregnant women have at least one ANC visit, more than in South Asia, at 54 percent (Lincetto et al., 2006). Coverage for ANC is usually expressed as the proportion of women who have had at least one ANC visit. However, coverage of at least four ANC visits is lower at 44 percent, as shown on the country profiles. Trends indicate slower progress in sub-Saharan Africa than in other regions, with an increase in coverage of only four percent during the past decade (Lincetto et al., 2006).

In Ghana 85% attended at least one antenatal visit with a skilled provider before delivery. Seventy-three percent of pregnant women in urban areas and 55% in rural areas were more likely to attend 4 or more antenatal visits. (Asundep et al., 2013). Though it has been reported that up to 40% of pregnant women in developing countries receive no ANC, a

study in Ghana reported that only 2.7% of women did not attend ANC at all (GDHS, 2014).

2.5 Influence of Maternal knowledge on obstetric and new-born danger signs

The World Health Organization (WHO) estimates that about 300 million women in the developing countries suffer from short and long-term illnesses due to complications related to pregnancy and childbirth (Hailu et al., 2010).

It has been suggested that health education and information conveyed to mothers about potential risks, as well as the counselling of danger signs, might lead to improved early decision making and care-seeking where access to health facilities is concerned (Pembe et al., 2010). Awareness of the danger signs of obstetric complications is the essential first step in accepting appropriate and timely referral to obstetric and new-born care (Pembe et al., 2009). Raising awareness of women on danger signs of pregnancy, childbirth and the postpartum period I s crucial for safe motherhood (Hailu, Gebremariam & Alemseged, 2010).

Antenatal care attendance in sub-Saharan Africa, should facilitate provision of information on signs of potential pregnancy complications (Pembe et al., 2010). Several studies conducted globally revealed a generally low knowledge of mothers on pregnancy obstetric danger signs and new-born danger signs especially in sub Saharan Africa.

Hailu, Gebremariam, & Alemseged (2010) reported that pregnant women in southern Ethopia had low level of knowledge of about obstetric danger signs (during pregnancy, childbirth and postpartum period). Their findings showed that 30.4%, 41.3% and 37.7% knew at least two danger signs during pregnancy, childbirth and postpartum period,

respectively. Being urban resident was consistently found to be strongly associated with mentioning at least two danger signs of pregnancy, child birth), and postpartum period.

Pembe et al., (2009) revealed that rural Tanzanian women had low awareness of danger signs of obstetric complications. Few women knew three or more danger signs. However, half of the women knew at least one obstetric danger sign. The percentage of women who knew at least one danger sign during pregnancy was 26%, during delivery 23% and after delivery 40%. The study further observed that mothers with secondary education or more increased the likelihood of awareness of obstetric danger signs six-fold in comparison with no education at all. The likelihood to have more awareness increased significantly by increasing age of the mother, number of deliveries, number of antenatal visits, whether the delivery took place at a health institution and whether the mother was informed of having a risks/complications during antenatal care. Women who made four or more antenatal care visits were more aware of danger signs, independent of gestational age at booking.

Results from a study by Kabakyenga et al., (2011) in rural Uganda also showed a low prevalence of women who had knowledge of pregnancy key danger signs. Fifty two percent (52%) of the women knew at least one key danger sign during pregnancy, 72% during delivery and 72% during postpartum. Only 19% had knowledge of 3 or more key danger signs during the three periods. The study further showed a significant relationship between knowledge of at least one key danger sign during pregnancy or during postpartum and birth preparedness. Young age and high levels of education had synergistic effect on the relationship between knowledge and birth

2.6 Summary of the Review

Overall, a review of the literature shows that several studies have been conducted in the area of new-born care practices outside Ghana. However, very few of such studies have been carried out in the country and none at all in the study area.

Majority of the studies reviewed showed that the prevalence of essential new-born care practices is generally low even though the proportion of women who had access to at least one antenatal care session was quite high. One would expect a direct proportional relationship between antenatal care utilization and the adoption of essential new-born care practices. However, most of the studies reviewed failed to establish the relationship between adequacy of antenatal care and adoption of essential new-born care practices. It is therefore prudent to conduct further studies into how the delivery of messages on essential new-born care practices is been carried out at ANC sessions.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

The validity and reliability of study findings depends largely on a carefully planned methodology. In this study, relevant data were meticulously collected through the application of appropriate methods. In order to ensure minimal biases in the study outcomes, the study design, sampling procedures, data collection techniques and tools as well as data analysis were carefully considered.

The study focused on areas such as recommended WHO new-born care practices, content and utilization of antenatal care, Birth Preparedness and Complication Readiness (BPACR), anthropometric measurements and WHO food consumption score.

A community based cross-sectional study design was applied to collect data on prenatal care and new-born care practices to determine the relationship between prenatal care and adoption of essential new-born care practices in the study area.

3.1 Study Area

The study would be carried out in the Kassena-Nankana Municipality which is one of the thirteen (13) Districts in the Upper East Region. The Municipality shares boundaries to the North with Kassena-Nankana West District and Burkina Faso, to the East with Kassena-Nankana West District and Bolgatanga Districts, to the West with Builsa North District and to the South with West Mamprusi District in the Northern Region (KNMA, 2010).

The municipality has an estimated population of 116,700 with a population density of 102 persons per square kilometer. The population density of 102 persons per square kilometer shows how dispersed the population is. The district consists of 110 communities –

majority of which are rural, only 13 per cent of the population live in towns. Only Navrongo can be classified as an urban settlement (KNMA, 2010)

The settlement pattern of the population is generally dispersed. This settlement pattern has effect on the distribution of facilities especially those of water and sanitation (KNMA, 2010).

The predominant ethnic groups in the district are Kassena, Nankam and Builsa all co-existing peacefully. However, there are few migrant workers from southern areas of the country (KNMA, 2010).

3.1.1: Climate

The Municipality experiences pronounced dry and wet seasons which are influenced by air masses. The Municipality is normally under the influence of the North East Trade winds, also known as Harmattan, from November to March each Year. Rainfall is absent during this period and temperatures are high averaging about 40°C. Relative humidity is also often low, averaging about 20%. The South West Trade winds are moist and bring rain to the district between May to October. Average rain of 950mm is experienced with peaks in August and average temperature of 29°C is experienced during this period (KNMA, 2010).

3.1.2 Occupational Distribution

Agriculture is the mainstay of the local economy and accounts for about 68% of the employable population. The remaining 32% is made up of public servants, traders, food processors and small-scale artisans (KNMA, 2010).

3.1.3 Health Facilities

The municipality is made up of seven sub-municipalities namely; Navrongo Central, Navrongo East, Pungu, Manyoro, Kologo and Wuru with twenty-four health facilities.

This is made up of: Municipal Hospital-1 Health Centres-2 Private Clinic-2 CHAG facility-1 Functioning CHPS zones-19 (KNMA, 2010).

3.2 Study Design

The study was carried out from February to July 2015 among lactating women who had infants aged 0-12 months using a community based analytic cross-sectional study design. The lactating mothers were visited and interviewed at home by the researcher and his team using a structured questionnaire.

3.3 Study Population

The primary study population comprised women of reproductive age (15-49 years) who had delivered a baby within 12 months prior to the study. The study was restricted to only one year postpartum women in order to avoid recall bias. The women were asked to recall antenatal care services they received during their last pregnancy as well new-born care practices they adopted.

3.4 Sample Size Determination

The sample size was calculated using the following formula (Snedecor and Cochran, 1989)

$$N = \frac{z^2 pq}{m^2} \times D$$

Where

N is the desired sample size

z is the statistical certainly chosen= 1.96 at a confidence level of 95%

p is the proportion of postnatal mothers who received adequate prenatal care (Unknown) = 0.5

q is the proportion of postnatal mothers did not receive adequate prenatal care practicing

1-p =

1- 0.5=0.5

m is the precision desired = 0.05 (5%)

D is design effect = 1.5

$N = \frac{(1.96)^2 \times (0.5)(0.5) \times 1.5}{(0.05)^2}$

$N = \frac{3.8416 \times 0.25 \times 1.5}{0.0025}$

N = 576.24. = 576

Hence, a total required sample size large enough to detect a reliable smallest difference in the relationship for the study was estimated at 576. However, allowing for a 10% non-response rate (that is, 58 respondents), the overall sample size was adjusted to 634 respondents.

3.5 Sampling Procedure

A multi stage sampling methodology was employed in the study. Five out of the seven sub municipalities in the Kassena-Nankana Municipality were first selected by way of simple random sampling. The selected sub municipalities were Vunania/Kapania, Wuru, Manyoro, Navrongo East and Pungu.

All communities with their respective populations in the randomly selected five sub municipalities were then fed into an Emergency Nutrition Assessment (ENA) for SMART 2011 software where 30 clusters were generated through probability proportionate to size (PPS) sampling methodology.

Finally, 634 households were then selected by way of systematic random sampling from the thirty selected clusters. A selected household was only eligible if a woman with a child 0-12 months was present. However, in instances where the selected household did not have a one year postpartum mother, it was skipped and the next household with an respondent was attended to.

3.6 Data Collection Methods and Tools

A structured questionnaire was the main tool used for the data collection. The structured questionnaire consisted of both opened and closed ended questions and was used to collect quantitative data. The primary data collected included maternal socio-demographic information, content and utilization of antenatal services received during last pregnancy, maternal knowledge on new-born danger signs and maternal experience on essential new born care and feeding practices.

Adequacy of antenatal care was measured by taking into consideration a pregnant woman initiating first ANC in the first trimester and making at least four ANC visits. The maternal and new-born care questionnaire also measured the content of antenatal care services received during the last pregnancy. The postnatal care questionnaire also measured the postnatal mothers' knowledge on basic new-born care danger signs and infant feeding practices which is critical for the survival of the infant especially within the neonatal period. The new-born care questions focused on areas such as cord care, thermal care, prevention of infection, early and exclusive breast feeding, immunization, treatment of new-born illness, and providing special care to immature and low birth weight infants

3.6.1 Sources of data

3.6.1.1 Primary Data

Primary data was collected directly from the field by the researcher through interviews with the respondents.

3.7.2 Secondary Data

Secondary data was collected from sources such as; the Kassena-Nankana Municipal Assembly, the Kassena-Nankana Municipal Health Directorate, Regional Health Directorate and related publications. Some of the data collected included; the profile of the Kassena-Nankana municipality, the population distribution of the municipality as well as neonatal and infant mortality rates.

3.6.2 Dependent and Independent Variables

Infant feeding practices, cord care and thermal care were the main outcome variables. Three composite outcome variables which give a more accurate measure of essential new-born care practices were created and used; (i) optimal thermal care (defined as baby wrapped within ten minutes of birth plus baby being dried/wiped immediately after birth plus first bath after 6 or more hours); (ii) safe cord care (defined as use of a clean cutting instrument to cut the umbilical cord plus clean thread to tie the cord plus no substance applied to the cord stump); and (iii) good neonatal feeding practices (defined as initiating breastfeeding within the first one hour after birth, giving no prelacteal and feeding the child with colostrum). The composite variables were then grouped into complete (all practices present) or incomplete (one or more practices missing).

The independent variables included socio demographic characteristics such as, maternal age, occupation of mothers, educational status, religion and marital status. Other variables such as utilization of antenatal care services, maternal knowledge on new-born danger signs as well as presence of a skilled birth attendant were assessed and used as explanatory variables.

3.7 Recruitment and Training of Research Assistants

For a successful execution of the study, four (4) research assistants were trained and used for the data collection. The research assistants were carefully recruited based on their

experience in previous studies. During the training, the research assistants were taken through the questionnaire, sampling techniques and anthropometric measurement. Before the commencement of the actual data collection, the questionnaire was pretested to identify gaps and ability of the tool to collect the desired information.

3.8 Data Processing and Analysis

The data collected from the field was examined and entered using Epi- info soft ware. The data was transferred into SPSS using Start Transfer. Descriptive and inferential statistics were performed using SPSS for windows version 21. Bivariate analysis was done to establish association of some of the variables collected. Chi-square statistics were done to compare the levels of each of the dependent variables with the explanatory variables using a significance level of $p<0.05$. Multiple logistic regression was used to identify the predictors of essential new-born care practices. The variables that were entered in the multiple linear regression model based on the results of the bivariate tests included presence of skilled birth attendant (SBA), maternal age, level of maternal education, antenatal care and knowledge of 3 danger signs during pregnancy. Analyzed data were presented as frequencies, means and odds ratio

3.9 Ethical Consideration

Ethical approval was sought from the Ethics Committee of the School of Medicine and Health Sciences, University for Development Studies. Informed verbal consent was obtained from all study participants before the commencement of any interview and only those who voluntarily accepted to partake in the study were included. The study participants also reserved the right to withdraw from the study at any time without any sanctions. The information collected from study participants was treated with utmost confidentiality and was not passed on to a third party but used for only academic purposes. The data collected for this study was only used for the purposes of this study.

3.10 Limitations of the study

The study was confronted with some limitations. Mothers who had delivered within a year prior to the study were included and were asked to recall past events. Not all the respondents could have been able to recall past events accurately and hence introducing some bias into the study. Therefore, the validity of the study could have been undermined by recall bias.

Some of the data collected were dichotomized into binary outcomes to aid in the analysis. This therefore meant condensing a number of responses into a single response. For example, a binary outcome was created for ANC attendance in which one to three ANC visits were grouped as one. However, making three ANC visits is not the same as making one visit.

Interpretation of the individual care practices in isolation in this study could be misleading. The various individual new-born care practices were combined into composite variables which gives a more accurate measure of new-born care practices.

Finally, the study could not determine any causal conclusions on the relationships observed because a cross-sectional study design was used in the study

Notwithstanding the aforementioned limitations, the study results have unraveled critical areas of new-born care practices that need to be urgently tackled.

CHAPTER FOUR

RESULTS

A total of Six Hundred and Thirty-Four (634) lactating mothers from thirty (30) clusters were sampled for the study. During the data cleaning process, thirty-four (34) cases were removed due to incomplete responses.

4.1 Study sample Characteristics

The distribution of socio-demographic characteristics of study participants are shown in Table 4.1. The mean age of the respondents was 28.8±6.0 years with the minimum and maximum ages of 16 and 45 years respectively. Majority of them (34.7 %) were in the age group of 20-24 years.

The vast majority 539 (90%) of the respondents were Christians with only 18 (3.0%) being Moslems. Half (50%) of the respondents were Kassena's followed by Nankana's and least of them belong to other ethnic groups such as Wali, Akan, Dagomba.

Majority (60.2%) of the respondents had basic (Primary or JHS) education with 28 % of them having no formal education. Interestingly, less than 1% of them had attained tertiary education.

Nine in ten (90%) of respondents were married with only 9% of them never married. Farming and trading were the main activities from which respondents earned income.

Table 4.1: Socio-demographic characteristics of respondents

Characteristic	Frequency (n)	Percent (%)
Age Groups (years)		
15-19	84	14.0
20-24	209	34.7
25-29	150	25.0
30-34	87	14.4
35-39	57	9.5
40-44	11	1.8
45-49	2	0.3
Total	600	100.0
Educational level		
No education	170	28.3
Primary school	199	33.2
JSS/JHS	162	27.0
Secondary school	64	10.7
Tertiary	5	0.8
Total	600	100.0
Religion		
Christianity	539	89.8
Islam	18	3.0
African Traditional Religion (ATR)	43	7.2
Total	600	100.0
Marital Status		
Single	56	9.3
Married	539	89.8
Divorced	5	0.8
Total	600	100.0

Source: Field Survey, 2015

Table 4.1: Socio-demographic characteristics of respondents

Background Characteristic	Frequency (n)	Percentage (%)
Ethnicity		
Buli	12	2.0
Kassena	302	50.3
Nankana	281	46.8
Other	5	0.8
Total	600	100
Main occupation of mother		
Unemployed /housewife	181	30.2
Farming	212	35.3
Trader	120	20.0
Seamstress	59	9.8
Salaried worker	7	1.2
Cook	2	0.3
food vendor	6	1.0
hair dresser	13	2.2
Total	600	100.0
Sex of Infant		
Male	298	49.7
Female	302	50.3
Total	600	100.0

Source: Field Survey, 2015

4.2 Utilization of Antenatal Care Services

Almost all (99.7%) of the women interviewed had received antenatal care at least once from a skilled provider during their last pregnancy. Majority (80.0%) of the ANC attendees had received care from the Community Health Planning and Services (CHPS) compound. More than half (56.0%) of the ANC attendees initiated ANC attendance in the first trimester of pregnancy. The minimum number of ANC visits was 1 whilst the maximum number was 12. Almost nine in ten (87.0%) women had four or more ANC visits during the last pregnancy as recommended by the World Health Organization (Table 4.2).

Of the 600 deliveries recorded, 84.3 % were conducted in health institutions with about 85.0% of the deliveries conducted by a skilled birth attendant (SBA).

Table 4.2 Utilization of Antenatal Care Services

	Frequency (n)	Percent (%)
Seek ANC During Last Pregnancy		
Yes	598	99.7
No	2	0.3
Total	600	100.0
Place ANC was received		
Government Hospital	61	10.2
Government Health centre	58	9.7
CHPS Compound	476	79.6
Private Clinic	3	0.5
Total	598	100.0

Source: Field Survey, 2015

Table 4.2 Utilization of Antenatal Care Services

	Frequency (n)	Percent (%)
Frequency of ANC Visits		
0-3	50	8.4
4+	517	86.5
Don't Know	31	5.2
Total	598	100.0
Gestational age at First ANC attendance		
1-3	336	56.2
4-6	225	37.6
7-9	25	4.2
Don't Know	12	2.0
Total	598	100.0
Place of delivery		
Home	94	15.7
Institutional	506	84.3
Presence of SBA at delivery		
Skilled	509	84.8
Unskilled	91	15.2
Total	600	100.0

Source: Field Survey, 2015

4.2.1 Content of ANC Services

During antenatal care, a number of services are usually rendered to pregnant women to protect them and the unborn baby from potential danger. Respondents were therefore asked the services they received from the health provider during their last pregnancy.

Table 4.3 shows that, majority (97%) of the ANC attendees had their weight checked at least two times during their ANC visits. A little above one-fourth (26.4%) of the ANC attendees did not have their height taken on the first visit. Majority (94%) of the respondents had their Blood Pressure checked at least three times. About 8 of 10 women

(75.4%) and 9 of 10 women (86.8%) had urine and blood sample examinations respectively performed at least once during the last ANC attendance. Interestingly, about thirty percent of the ANC attendees did not receive health and nutrition counselling at least four times on the possible danger signs/ complication of pregnancy.

Majority (89.0%) of the respondents had received tetanus toxoid injection at least once to protect the unborn child from neonatal tetanus. Almost all the women (99.0%) of the ANC attendees had received the monthly iron supplementation to prevent anaemia.

Table 4.3 ANC Services Received by Respondent (Multiple responses)

	Frequency	Percent
Weight Checked on Your First Visit	577	96.5
Height Taken on Your First Visit	440	73.6
Blood Pressure Taken At Least Three Times	562	94.0
Urine Examination Performed At Least Once	451	75.4
Blood Sample Examination Performed At Least Once	519	86.8
Received Health And Nutrition talk	419	70.1
Received TT Injection	532	89.0
Received Iron Supplement	589	98.5
Measurement of Fundal Height	544	91.0
Received Malaria Pophylaxis	564	94.3

Source: Field Survey, 2015

4.3 Prevalence of Essential New-born Practices

Majority (77.0%) of the new-borns had their cord cut using Scissors. Fourteen Percen (14.0%) of the new-borns had their cord tied with a thread against the WHO recommended practice on cord care. About 2% of the new-borns had their cord either tied with a piece of glove or tied with nothing at all.

Almost all the respondents reported having to apply some kind of substance mainly methylated spirit or shea-butter on the cord stump. Interestingly, about three percent (3%) of mothers applied boiled akpetshie (local gin) on the cord.

The WHO recommends that new-borns should be wrapped immediately after delivery to prevent hypothermia which can result in neonatal deaths. However, bathing of new-borns should be delayed after six hours or beyond.

From Table 4.4, majority (58.0%) of the new-borns were wrapped less than 5 minutes after delivery. However, 42% of the new-borns were bathed within six hours after birth.

Table 4.4 Prevalence of Essential New-born Practices

	Frequency (n)	Percent (%)
Cord Cutting Instrument		
New blade	97	16.2
Scissors	461	76.8
Don't Know/Can't Remember	42	7.0
Total	600	100.0
Material Used to tie Cord		
Thread	83	13.8
Cord tie	82	13.7
Cord clamp	424	70.7
Others	11	1.8
Total	600	100.0

Source: Field Survey, 2015

Table 4.4 Prevalence of Essential New-born Practices

	Frequency (n)	Percent (%)
Material Applied on Cord		
Nothing	31	5.2
Oil/shea butter	182	30.3
Methylated spirit	365	60.8
Shea butter with powder	3	0.5
Ointment	3	0.5
Boiled Akpeteshie	15	2.5
Don't Know	1	0.2
Total	600	100.0
Time Before Wrapping		
Less than 5 minutes	347	57.8
5 to 10 minutes	121	20.2
More than 10 minutes	55	9.2
Unknown	77	12.8
Total	600	100.0
How Long Before Bathing of Child		
Soon after delivery	81	13.5
1 to 6 hours	171	28.5
More than 6 hours but less than 24 hours	227	37.8
More than 24 hours	103	17.2
Cannot tell	18	3.0
Total	600	100.0
How Long Before Child Was Put To Breast		
Within 30 minutes	264	44.0
During the first 1 hour	156	26.0
2-8 hours	120	20.0
The next day	38	6.3
Do not remember	22	3.7
Total	600	100.0

4.3.1 Association between prenatal care utilization and essential new-born care practices

The following composite outcome variables were created: (i) safe cord care (defined as use of a clean cutting instrument to cut the umbilical cord plus clean thread to tie the cord plus no substance applied to the cord); (ii) Optimal thermal care (defined as baby wrapped within 10 minutes of birth plus first bath after 6 or more hours and (iii) Good neonatal feeding (defined as initiating breastfeeding within the first one hour after birth plus child currently breastfeeding, plus no prelacteal given and colostrum fed to the child). These composite variables were then dichotomized to Yes (all practices present) or No (one or more practices missing).

Only 37 (6.2 %) of respondents were judged to have had safe cord care, 214 (35.7%) optimal thermal care, and 398 (66.3%) were considered to have had adequate neonatal feeding. The prevalence of essential new born practices as recommended by the WHO was generally low. Table 4.5 shows the association between adequacy of prenatal care utilization and essential new-born care practices. Adequacy of prenatal care utilization was significantly associated with only good neonatal feeding practices.

Table 4.5: Prevalence of essential new-born care practices stratified by prenatal care utilization (n = 590)

Prenatal care utilization	N	New born care practice		
		Good neonatal feeding practices n (%)		Test statistic
Adequacy of ANC		No	Yes	
No	273	108 (39.6)	165 (60.4)	χ^2 = 6.40
Yes	317	94 (29.7)	223 (70.3)	p = 0.01
Total	590	202 (34.2)	388 (65.8)	
		Optimal thermal care n (%)		
		No	Yes	
Adequacy of ANC				
No	273	174 (63.7)	99 (36.3)	χ^2 = 0.0
Yes	317	202 (63.7)	115 (36.3)	p = 0.99
Total	590	376 (63.7)	214 (36.3)	
		Safe cord care n (%)		
		No	Yes	
Adequacy of ANC				
No	273	254 (93.0)	19 (7.0)	χ^2 = 0.41
Yes	317	299 (94.3)	18 (5.7)	p = 0.52
Total	590	553 (93.7)	37 (6.3)	

Source: Field Survey, 2015

4.4 Predictors of essential new-born care practices

Bivariate analyses showed that uptake of prenatal care services, the presence of skilled births attendants (SBA), maternal age, level of maternal education and knowledge of 3 danger signs during pregnancy were associated with essential new-born care practices (Tables 4.6 to 4.8).

Table 4.6 Predictors of good neonatal feeding (Bivariate analysis)

Variable	N	Good neonatal feeding?		Test statistic
		No n (%)	Yes n (%)	
Age (years)				
Under 25 years	**293**	92 (31.4)	201 (68.6)	Chi-square (χ^2) = 19.8 , p < 0.001
25-34 years	237	70 (29.5)	167 (70.5)	
At least 35 years	70	40 (57.1)	30 (42.9)	
Presence of skilled birth attendant (SBA)				
No	**89**	43 (48.3)	46 (51.7)	Chi-square (χ^2) = 10.0 , p = 0.002
Yes	**511**	159 (31.1)	352 (68.9)	
Place of delivery				
Home	**94**	45 (47.9)	49 (52.1)	Chi-square (χ^2) = 10.1 , p = 0.002
Hospital	**506**	157 (31.0)	349 (69.0)	
Initiation of first ANC				
>3	**250**	104 (41.6)	146 (58.4)	Chi-square (χ^2) = 10.8 , p = 0.001
≤ 3 months	**336**	96 (28.6)	240 (71.4)	
Maternal education				
None	170	42 (24.7)	128 (75.3)	
Low	361	144 (39.9)	217 (60.1)	χ^2 = 15.7, p < 0.001
High	69	16 (23.2)	53 (76.8)	

Source: Field Survey, 2015

Table 4.6 Predictors of good neonatal feeding (Bivariate analysis)

Variable	N	**Good neonatal feeding?**		Test statistic
		No n (%)	Yes n (%)	
Adequacy of ANC services?				
No	273	108 (39.6)	165 (60.4)	χ^2 =6.4, p = 0. 01
Yes	317	94 (29.7)	223 (70.3)	
Knowledge of 3 danger signs during pregnancy				
No	382	148 (38.7)	234 (61.3)	χ^2 =12.1, p < 0. 001
Yes	218	54 (24.8)	164 (75.2)	
Knowledge of 3 new-born danger signs				
No	282	113 (40.1)	169 (59.9)	χ^2 =9.8, p < 0. 001
Yes	318	89 (28.0)	229 (72.0)	

Source: Field Survey, 2015

Table 4.7 Predictors of optimal thermal care (Bivariate analysis)

Variable	N	Optimal thermal care?		Test statistic
		No n (%)	Yes n (%)	
Age (years)				
Under 25 years	**293**	177 (60.4)	116 (39.6)	Chi-square (χ^2) = 8.2 , p = 0.02
25-34 years	237	154 (65.0)	83 (35.0)	
At least 35 years	70	55 (78.6)	15 (21.4)	
Presence of skilled birth attendant (SBA)				
No	**89**	87 (97.8)	2 (2.2)	Chi-square (χ^2) = 50.9 , p < 0.001
Yes	**511**	299 (58.5)	212 (41.5)	
Place of delivery				
Home	**94**	92 (97.9)		Chi-square (χ^2) = 54.6 , p = 0.002
Hospital	**506**	97.9%		
Maternal education				
None	170	123 (72.4)	47 (27.6)	
Low	361	225 (62.3)	136 (37.7)	χ^2 = 7.9, p = 0.02
High	69	38 (55.1)	31 (44.9)	
Classification household wealth index				
Low	482	319 (66.2)	163 (33.8)	χ^2 =3.7, p = 0. 06
High	118	67 (56.8)	51 (43.2)	
Content of ANC services received				
Low (< 5)	13	5 (38.5)	8 (61.5)	χ^2 =3.8, p = 0. 05
≥5	585	379 (64.8)	206 (35.2)	

Source: Field Survey, 2015

Table 4.8 Predictors of safe cord care (Bivariate analysis)

Variable	N	**Safe cord care?**		Test statistic
		No n (%)	Yes n (%)	
Age (years)				
Under 25 years	**293**	278 (94.9)	15 (5.1)	Chi-square (χ^2) = 12.5 , p = 0.002
25-34 years	237	226 (95.4)	11 (4.6)	
At least 35 years	70	59 (84.3)	11 (15.7)	
Presence of Skilled Birth Attendant (SBA)				
No	**89**	67 (75.3)	22 (24.7)	Chi-square (χ^2) = 62.2 , p < 0.001
Yes	**511**	496 (97.1)	15 (2.9)	
Place of delivery				
Home	**94**	69 (73.4)	25 (26.6)	Chi-square (χ^2) = 80.4 , p < 0.001
Hospital	**506**	494 (97.6)	12 (2.4)	
Frequency of ANC visits				
0-3	**50**	41 (82.0)	9 (18.0)	Chi-square (χ^2) = 11.8 , p = 0.001
≥ 4	**517**	489 (94.6)	28 (5.4)	
ANC Content				
Low	13			χ^2 = 4.9, p = 0.026
High	585			
Knowledge of 3 danger signs during pregnancy				
No	382	353 (92.4)	29 (7.6)	χ^2 = 3.7, p = 0.06
Yes	218	210 (96.3)	8 (3.7)	

Source: Field Survey, 2015

4.4.1 Factors associated with composite essential new-born care practices

The association between socio-demographic characteristics and composite essential new-born care practices (good neonatal feeding, optimal thermal and safe cord practices) was investigated using multivariable logistic regression analyses. The determinants of good neonatal feeding practices are shown in Tables 4.9

Mothers aged at least 35 years were 73 % less likely (AOR=0. 27 [CI: 0.14, 0.50]) to practice good neonatal feeding as compared to those who were less than 25 years.

Attendance of antenatal care of four or more times was not associated with good neonatal feeding but timely initiation of first ANC visit was positively associated with good neonatal feeding practices. Women who initiated ANC in the first trimester were about 1.6 times (AOR=1. 55 [CI: 1.07, 2.25]) more likely to feed their neonates appropriately as compared to their counterparts who initiated ANC late.

The other strong predictor of good neonatal feeding was presence of skilled birth attendant (SBA) during the last delivery. Having a SBA during birth was significantly associated with good neonatal feeding practices (AOR=2. 75 [CI: 1.60, 4. 73]).

Women who could mention at least three danger signs during pregnancy and new-born danger signs were 1.6 times (AOR=1. 61 [CI: 1.05, 2.46] and 1.5 times (AOR=1. 52 [CI: 1.04, 2.23] more likely to practice good neonatal feeding preactices respectively.

The set of variables accounted for 17.0 % of the variance in good neonatal feeding (Nagelkerke R Square = 0.17

Table 4.9 Predictors of good neonatal feeding (Multivariate analysis)

Variable	Wald	Sig.	Adjusted Odds (AOR)	95% Confidence Interval	
Maternal Age (years)					
Under 25	Reference	Reference	Reference	Reference	Reference
25-34	2.67	0.102	0.70	0.46	1.07
≥ 35	16.90	<0.001	0.27	0.14	0.50
Timing of first ANC visit					
> 3 months	Reference	Reference	Reference	Reference	Reference
≤ 3 months	5.29	0.02	1.55	1.07	2.25
Presence of skilled birth attendant					
No	Reference	Reference	Reference	Reference	Reference
Yes	13.36	<0.001	2.75	1.60	4.73
Maternal knowledge of at least 3 danger signs during pregnancy					
No	Reference	Reference	Reference	Reference	Reference
Yes	4.81	0.03	1.61	1.05	2.46
Maternal knowledge of at least 3 new-born danger signs					
No	Reference	Reference	Reference	Reference	Reference
Yes	4.58	0.03	1.52	1.04	2.23
Maternal Education					
None	Reference	Reference	Reference	Reference	Reference
Low (Primary or JHS	29.02	< 0.001	0.25	0.15	0.41
High (At least SHS)	7.092	0.008	0.35	0.16	0.76

Source: Field Survey, 2015

In multivariable logistic regression analysis, delivery at a health facility was the only independent variable that predicted optimal thermal care for the neonate and it alone accounted for 16.0 % of the variance in optimal thermal care (Nagelkerke R Square = 0.16)

Delivery at a health facility and frequent ANC visits accounted for 26.9 % of the variance in safe cord care (Nagelkerke R Square = 0.269)

Women who delivered in a health facility were 93 % less likely (AOR=0. 07 [CI: 0.03, 0.14]) to practice safe cord care but 33.2 times more likely (AOR=33. 17 [CI: 8.08, 136.10]) to give optimal thermal care to their babies as compared to those who delivered their recent child at home.

The other strong predictor of safe cord care was frequency of ANC visits. Surprisingly, women who made at least four visits during the last pregnancy were 68 % less likely to practice safe cord care (AOR=0. 32 [CI: 0.13, 0. 80]) (Table 4.10).

Table 4.10: Predictors of optimal thermal and safe cord practices

Variable	Safe cord care		Optimal thermal care	
	Wald	AOR (95% CI)	Wald	AOR (95% CI)
Place of delivery				
Home	Reference	Reference	Reference	Reference
Health facility	50.03	0.07 (0.03, 0.14)***	23.63	33.17 (8.08, 136.1)***
Frequency of ANC visits				
0-3	Reference	Reference	Reference	Reference
≥ 4	5.87	0.32 (0.13, 0.80)*		

Source: Field Survey, 2015

*significant at p <0.05; **significant at p <0.01; ***significant at p <0.001

AOR (95% CI): Adjusted odds ratio at 95% confidence level

4.5 Maternal knowledge of pregnancy obstetric danger signs and new-born danger signs

Maternal knowledge of danger signs during pregnancy and the new-born were assessed. Maternal Knowledge on new-born danger signs is very crucial for seeking prompt medical attention for new-borns and prevention of minor ailments from worsening and resulting in possible deaths among infants. Respondents were therefore interviewed to assess their knowledge on the danger signs of new-borns. Majority (88%) of the respondents identified fever as the main sign of danger in new-borns. However, knowledge on the other danger signs was generally poor. For instance, less than twelve percent (118) mentioned convulsion as a new-born danger sign whiles only eight percent mentioned hypothermia as a new-born danger sign. However, about forty percent and twenty percent of the respondents mentioned baby crying a lot and diarrhoea respectively as danger signs among new-borns Table 4.11 shows results of knowledge of respondents on new-born danger signs

Table 4.11 Knowledge of respondents on new-born danger signs

Danger Sign	Frequency (n)	Percent (%)
Poor Suckling		
No	387	64.5
Yes	213	35.5
Total	600	100.0
Convulsion		
No	529	88.2
Yes	71	11.8
Total	600	100.0
Difficulty in Breathing		
No	544	90.7
Yes	56	9.3
Total	600	100.0

Source: Field Survey, 2015

Table 4.11 Knowledge of respondents on new-born danger signs

Danger Sign	Frequency (n)	Percent (%)
Blue baby		
No	579	96.5
Yes	21	3.5
Total	600	100.0
Sleeps Too Much		
No	556	92.7
Yes	44	7.3
Total	600	100.0
Hot Body		
No	75	12.5
Yes	525	87.5
Total	600	100.0
Cold Body		
No	551	91.8
Yes	49	8.2
Total	600	100.0
Red Cord		
No	551	91.8
Yes	49	8.2
Total	600	100.0
Skin Sores		
No	517	86.2
Yes	83	13.8
Total	600	100.0
Eye Discharge		
No	546	91.0
Yes	54	9.0
Total	600	100.0

Source: Field Survey, 2015

Table 4.11 Knowledge of respondents on new-born danger signs

Danger Sign	Frequency (n)	Percent (%)
Yellow Eyes		
No	518	86.3
Yes	82	13.7
Total	600	100.0
Small Baby		
No	594	99.0
Yes	6	1.0
Total	600	100.0
Cries A Lot		
No	361	60.2
Yes	239	39.8
Total	600	100.0
Vomiting		
No	521	86.8
Yes	79	13.2
Total	600	100.0
Diarrhoea		
No	482	80.3
Yes	118	19.7
Total	600	100.0
Feels Weak		
No	539	89.8
Yes	61	10.2
Total	600	100.0

Source: Field Survey, 2015

Knowledge of danger signs in pregnancy by a pregnant woman is very critical for timely identification and adoption of strategies to mitigate potential threats that could affect both the woman and the unborn baby. Knowledge of respondents was therefore assessed on the danger signs of pregnancy. Table 4.12 shows that 54% and 42% of the respondents mentioned abdominal pains and bleeding as the main danger signs in pregnancy. Knowledge on the other danger signs in pregnancy was generally low. For example, only twenty-one (21%) of the respondents mentioned swelling of the feet whiles less than nine percent (9%) mentioned pallor (a sign of anaemia in pregnancy). Less than two percent (1.7%) of the respondents also mentioned baby not kicking as a danger sign in pregnancy.

Table 4.12: Knowledge of respondents on pregnancy Danger signs (Multiple responses)

Pregnancy Danger Sign	Frequency	Percent (%)
Bleeding		
No	351	58.5
Yes	249	41.5
Total	600	100.0
Headache		
No	375	62.5
Yes	225	37.5
Total	600	100.0
Swelling Feet		
No	473	78.8
Yes	127	21.2
Total	600	100.0
Pallor		
No	547	91.2
Yes	53	8.8
Total	600	100.0

Source: Field Survey, 2015

Table 4.12 Knowledge of respondents on pregnancy Danger signs (Multiple responses)

Pregnancy Danger Sign	Frequency	Percent (%)
Fever		
No	542	90.3
Yes	58	9.7
Total	600	100.0
Abdominal Pain		
No	274	45.7
Yes	326	54.3
Total	600	100.0
Vomiting		
No	390	65.0
Yes	210	35.0
Total	600	100.0
Don't Know		
No	545	90.8
Yes	55	9.2
Total	600	100.0
Body Pains		
No	565	94.2
Yes	35	5.8
Total	600	100.0

Source: Field Survey, 2015

Table 4.12 Knowledge of respondents on pregnancy Danger signs (Multiple responses)

Pregnancy Danger Sign	Frequency	Percent (%)
Other		
No	468	78
baby not kicking	10	1.7
High BP	5	0.8
Candida	5.0	0.8
child not kicking	2.0	0.3
Diarrhoea	11	1.8
Dizziness	25	4.2
Malaria	28	4.7
loss of appetite	23	3.8
STI	1	0.2
unable to sleep	2	0.3
Vulva itching	2	0.3
waist pains	5	0.8
Weakness	5	0.8
Total	600	100.0

Source: Field Survey, 2015

4.5.1 Predictors of maternal knowledge of danger signs during pregnancy

Out of 600 respondents, 36.3 % and 53.0 % knew at least three key danger signs of pregnancy and new-born respectively. Compared to their counterparts who did not make four ANC visits during their pregnancy, women who made at least four visits were 2.2 times (AOR=2. 15 [CI: 1.05, 4.41]) more likely to have higher knowledge of danger signs of pregnancy.

Women who attained at least senior high school education were 8 times more likely to spontaneously mentioned at least three danger signs of pregnancy (AOR=8. 34 [CI: 4.17, 16.68]), compared to women who had no formally education. Women aged 25-34 years

were 2.3 times more likely to spontaneously mentioned at least three danger signs of pregnancy (AOR=2. 31 [CI: 1.52, 3.52]), compared to women who were under 25 years of age (Table 4.13).

Table 4.13: Predictors of maternal knowledge of danger signs during pregnancy

Variable	Wald	Sig.	Adjusted Odds (AOR)	95% Confidence Interval	
Maternal Age (years)					
Under 25	Reference	Reference	Reference	Reference	Reference
25-34	15.39	<0.001	2.31	1.52	3.52
≥ 35	1.85	0.17	1.55	0.82	2.92
Frequency of ANC					
< 4	Reference	Reference	Reference	Reference	Reference
≥ 4	4.34	0.04	2.15	1.05	4.41
Timely initiation of breastfeeding					
No	Reference	Reference	Reference	Reference	Reference
Yes	9.64	0.002	1.96	1.28	2.99
Household wealth index					
No	Reference	Reference	Reference	Reference	Reference
Yes	5.99	0.014	1.89	1.14	3.16
Maternal Education					
None	Reference	Reference	Reference	Reference	Reference
Low (Primary or JHS	4.77	0.03	1.65	1.05	2.60
High (At least SHS)	35.887	<0.001	8.34	4.17	16.68

Source: Field Survey, 2015

*significant at p <0.05; **significant at p <0.01; ***significant at p <0.001

AOR (95% CI): Adjusted odds ratio at 95% confidence level

4.6 Birth Preparedness and Complication Readiness (BPACR) Practices

Birth preparedness for a woman entails identifying a skilled attendant/health facility with delivery services, making transportation plans, saving money and identifying a blood donor

Respondents were asked about measures they instituted in readiness for the birth of the unborn child and complications that might arise during delivery. From Table 4.14, it is clear that the Birth Preparedness and Complication Readiness practices by respondents were unsatisfactory. Only thirty-one percent of the respondents had identified a health facility to go during delivery or in case of complications. Arrangement for transport in case of labour or complications during labour was reported in less than 18 percent. About seven of ten women (67.3%) did not save money towards delivery of the new-born but majority (74.8%) of them had bought antiseptics and clothes that would be required during delivery.

Table 4.14 Birth Preparedness and Complication Readiness

Identified A Trained Birth Attendant	Frequency	Percent
No	526	87.7
Yes	74	12.3
Total	600	100.0
Identified A Health Facility		
No	417	69.5
Yes	183	30.5
Total	600	100.0
Arranged For Transport		
No	493	82.2
Yes	107	17.8
Total	600	100.0

Source: Field Survey, 2015

Table 4.14 Birth Preparedness and Complication Readiness

	Frequency	Percent
Saved Money		
No	404	67.3
Yes	196	32.7
Total	600	100.0
Bought Antiseptics and Clothes		
No	151	25.2
Yes	449	74.8
Total	600	100.0
Other		
No	575	95.8
Can't remember	2	.3
Nothing	23	3.8
Total	600	100.0

Source: Field Survey, 2015

A woman was classified as "well birth prepared" in the most recent pregnancy if she had accomplished three of the following practices: identified skilled birth attendant/health facility, saved money, arranged for transport or had delivery kit/materials. A woman who made arrangements for birth in less than three of the four ways was classified as "not well birth prepared"

Of the four birth preparedness practices considered in the study, Only 11.3 % of respondents were thus classified as well birth prepared.

CHAPTER FIVE

DISCUSSION

5.0 Introduction

This study was one of the few studies that assessed the relationship between prenatal care and the adoption of essential new-born care practices in the Upper East Region of Ghana using a community-based cross-sectional study design.

Findings of the study revealed that practice of essential new-born care practices was generally poor as only 37 (6.2%)of respondents were judged to have had safe cord care, 214 (35.7%) had optimal thermal care, and 398 (66.3%) were considered to have had adequate neonatal feeding.. Adequacy of prenatal care utilization was significantly associated with only good neonatal feeding practices.

A review of literature by the author shows that no community level studies have evaluated the influence of prenatal care on the adoption essential new-born care in the Upper East Ghana. Findings of this study will therefore be useful guide to the design of interventions and policy for maternal and neonatal health cognizant of the reality on the ground

5.1 Utilization of Antenatal Care Services

Antenatal care (ANC) is mainly aimed at timely identification and treatment of problems such as anaemia and infections during pregnancy. ANC sessions are usually avenues where screening for complications and counselling on a range of issues, including birth preparedness, place of delivery, and referral of mothers with complications, occur. Information on antenatal care is of great value in identifying subgroups of women who do not use such services and is useful in planning improvements in these services (GDHS, 2014). According to Lincetto et al., (2006), up to 14 percent, or 160,000 more new-born lives could be saved in Africa if 90 percent of women received antenatal care.

The proportion of women who received antenatal care at least once from a skilled provider during their last pregnancy was generally high (99.7%). However, 86.5% of the ANC attendees made at least four visits before delivering. Findings of this study are consistent with results of several studies conducted by previous researchers. The recent 2014 Ghana Demographic and Health Survey report estimates that 98.4% and 93.0% of women in the Upper East Region received ANC at least once from a skilled provider and at least four visits respectively (GDHS, 2014).

Similar studies observed that 85% of women in Ghana received at least one antenatal care from a skilled provider (Asundep et al., 2013); 94% of pregnant women in Tanzania make at least one antenatal care visit, while only 62% make four or more visits (Pembe et al., 2010).

One could speculate that the high ANC coverage observed in this study could be attributed to the availability of antenatal care services at all CHPS facilities within almost every electoral area in the municipality. The World Health Organization (WHO) recommends that a woman without complications make at least four antenatal care visits, the first of which should take place during the first trimester. Women who met these conditions were deemed to have had adequate antenatal care. Slightly above half (53.7%) of the ANC attendees had adequate antenatal care.

Access to proper medical attention and hygienic conditions during delivery is critical for reducing most maternal deaths due to complications during labour and delivery. Even with the best possible antenatal care, any delivery can become a complicated one and, therefore, skilled assistance is essential to safe delivery care (GDHS, 2014). Findings of this study show that more than eight in ten (85.2%) of the deliveries were supervised by a Skilled Birth Attendant whiles 84.3% of the births were delivered in a health facility. This

study results are higher than the national coverage of supervised and institutional deliveries of 73.7% and 73.1% respectively (GDHS, 2014). However, the study findings are consistent with coverage of supervised and institutional deliveries in the upper east region which are estimated to be 84.6% and 84.1% respectively (GDHS, 2014).

5.2 Prevalence and determinants of essential new born practices

Three composite outcome variables (safe cord care, optimal thermal care, and good neonatal feeding) were created and investigated. These composite variables give a better reflection of essential new-born care practices. The prevalence of essential new born practices as recommended by the WHO was generally low.

Safe Cord Care

Safe cord care was defined in this study as use of a clean cutting instrument to cut the umbilical cord plus clean thread to tie the cord plus no substance applied to the cord.

Results of the study showed that in 83.8% of the cases a new razor blade or scissors was used to cut the umbilical cord of the new-borns as recommended by World Health Organization. It has been observed in this study that poor cord care was driven mainly by the application of potentially infectious substance on the cord as was seen in 94.6% of the cases. Substances such as methylated spirit, shea-butter and boiled akpetshie (local gin) were applied in order to hasten the healing process. Mothers who applied boiled akpeteshie to the cord stump said they were told to do so by the midwife who supervised their delivery. Similar findings have been reported in northern Ghana (Saaka & Iddrisu, 2014) where unhygienic cord care practices were prevalent.

In 16.0% of the deliveries, the cord of the new-borns were either tied with a thread, a piece of glove or nothing at all against the WHO recommended practice on cord care.

Findings of this study are in line with that of Saaka & Iddrisu (2014) where only 0.2% of new-borns in northern Ghana, 23.7% of new-borns in Masindi, Uganda (Ayiasi et al.,

2014) and in eastern Uganda where only 38% of the new-borns were judged to have had good cord care (Waiswa et al., 2010). The application of substances on the cord has been observed generally as a common practice, future cord care interventions should therefore examine alternative substances that could be applied safely to the cord without infections (Ayiasi et al., 2014) Previous studies have identified various factors that influence safe cord care practices. Results of this study showed that women who delivered at a health facility and women who had adequate ANC visits (at least four visits) were less likely to practice safe cord care. This observation is in contrast with a similar study by Ayiasi et al., (2014) in which a significant association was observed between place of delivery and safe cord care practice bur no association between adequate ANC visits and safe cord care.

Optimal Thermal care

Optimal thermal care is crucial for preventing new-born deaths due to hypothermia and was defined in this study as baby wrapped within 10 minutes of birth plus first bath after 6 or more hours. Results from this study revealed that 35.7% of the study participants were judged to have had optimal thermal care. However, 42.0% of the new-borns were bathed within six hours after birth against the World Health Organization's recommendation which indicates that bathing of new-borns should be delayed at least six hours after birth and beyond. It has been observed in this study that, both early bathing of the baby within the first six hours of birth and wrapping of new-borns within ten minutes of birth were the main drivers for the low thermal care practices. Bathing new-borns early do not only expose them to hypothermia but also removes maternal bacteria and the vernix caseosa (a potent inhibitor of *Escherichia coli*) (Tollin, et al., 2005) and eliminates the crawling reflex (Righard and Alade,1990). The Vernix serves as a protective barrier from liquids while in the uterus, acts as an antioxidant, skin cleanser, temperature regulator and a natural, safe anti-microbial for the new baby post delivery (WHO, 1996).

Bathing the new-born in less than six hours after delivery appears to be practiced within many cultures. A study in northern Ghana reported that 93.6% of new-borns were bathed within the first six hours of birth (Saaka and Iddrisu, 2014). Another study in Nepal revealed that 92% of new-borns had been bathed within the first hour of birth (Osrin et al., (2002). Another study in Pakistan by Fikree and colleagues (2005) showed that 82.1% of new-borns were bathed immediately after delivery.

The poor thermal care practices observed in this study is comparable to a similar study conducted in northern Ghana where only 5.2% were judged to have optimal thermal care (Saaka and Iddrisu, 2014). Findings of this study is also in line with a similar study in Masindi, Uganda by Ayiasi et al., (2014) where only 6.1% of new-borns and in eastern Uganda by Waiswa et al (2010) where 42% of new-borns were judged to have optimal thermal care.

Good Neonatal Feeding

Good neonatal feeding was defined in this study as initiating breastfeeding within the first one hour after birth plus child currently breastfeeding, plus no prelacteal given and colostrum fed to the child.

Timely initiation of breastfeeding (TIBF) rate (that is, proportion of children born in the last 12 months who were put to the breast within one hour of birth) was 70.0% and was higher than what was obtained from the 2013 Nutrition Surveillance System (NSS) survey where early initiation of breastfeeding for children living in the upper east region was below 50 percent (46.9%). Results of this study is also higher than what was reported in the 2011 Multiple Indicator Cluster Survey (MICS) in which timely initiation breastfeeding rates nationally and in the upper east region were 45.9% and 55.6% respectively. However, findings of this study is in line with what was reported in northern

region of Ghana where 73.5% of new-borns were put to the breast within the first hour of birth as recommended by WHO (Saaka and Iddrisu, 2014).

Early initiation of breastfeeding is beneficial to both the new born and the mother. Putting the baby to the breast within the first hour of birth helps to stimulates breast milk production and contraction of the uterus which reduces postpartum bleeding.

It has been an established fact that the suckling reflex of a new-born is at its peak 20 to 30 minutes after birth. If the infant is not fed at this time, the reflex diminishes rapidly to reappear adequately 40 hours later (Saaka and Iddrisu, 2014).

The first breast milk contains colostrum, which is highly nutritious and has antibodies that protect the new-born from diseases. Besides, breastfeeding soon after delivery also has a laxative effect on the meconium. The early evacuation of meconium tends to decrease the reabsorption of bilirubin (the yellow pigment responsible for jaundice). Bilirubin is liberated by the breakdown of cast-off red blood cells present in the intestines. Decreased reabsorption of bilirubin reduces the appearance of jaundice (Saaka and Iddrisu, 2014).

Despite the high coverage of institutional deliveries reported, timely initiation of breastfeeding was comparatively low. It can be speculated that some midwives or health staff conducting the deliveries may not be prompting mothers to initiate breastfeeding early. Another reason could be that, some of the mothers went through caesarian section and might not be in the right condition to initiate breastfeeding within the first hour of birth.

Results of this study show that 66.3% (398) of the new-borns were considered to have had adequate neonatal feeding. The study findings are consistent with a similar study carried out in the northern region where 50.2% of new-borns (Saaka and Iddrisu, 2014) and in eastern Uganda where 57% of new-born were considered to have had adequate neonatal feeding (Waiswa et al., 2010).

It has been observed in this study that, adequacy of prenatal care utilization was significantly associated with only good neonatal feeding practices. This could be due to the fact that health education during antenatal sessions usually includes infant feeding practices but little or virtually nothing is said about the other essential new-born care practices (optimal thermal care and safe cord care practices).

The study also observed that uptake of prenatal care services, presence of skilled births attendants (SBA), maternal age, level of maternal education and Knowledge of 3 danger signs during pregnancy influence essential new-born care practices. Younger mothers tend to practice good neonatal feeding than older mothers. This may be due to the fact that, younger mothers do not have a lot of experience about child caring practices and hence tend to follow what they are told during antenatal care sessions. However, older mothers may feel as being experienced and hence may be complacent with regards to certain infant feeding practices. The study also observed that, the higher a mother's education, the more likely she will practice good neonatal feeding.

The generally low prevalence of new-born care observed in this study implies that most new-borns at the community level either have little or no access to new-born care practices. All stakeholders especially Ghana Health Service should therefore incorporate key messages on essential new-born care practices into the routine ANC health education sessions to boost the knowledge levels of expectant mothers with regards new-born care even beyond the facility level.

5.3 Antenatal care and its effect on new-born care practices

The content of antenatal care is measured by the essential service package rendered to pregnant women. This package usually comprises prevention and management of anaemia and malaria, which are achieved through screening and appropriate management. Other

essential care package such as micronutrient supplementation, tetanus immunization as well as monitoring of certain vital signs are also rendered to pregnant women and helps in the timely detection and management of complications. Pregnancy complications are a primary source of maternal and new-born morbidity and mortality (GDHS, 2014).

One could safely expect that birth outcomes and adoption of certain essential new-born care practices including safe cord care, optimal thermal care and good neonatal feeding would to a large extent depend on the quality of antenatal care received.

Adequacy of prenatal care utilization was significantly associated with only good neonatal feeding practices. Attendance of antenatal care of four or more times was not associated with good neonatal feeding but timely initiation of first ANC visit was positively associated with good neonatal feeding practices. Women who initiated ANC in the first trimester were more likely to feed their neonates appropriately as compared to their counterparts who initiated ANC late. The other strong predictor of good neonatal feeding was presence of skilled birth attendant (SBA) during the last delivery. Having a SBA during birth was significantly associated with good neonatal feeding practices.

5.5 Maternal knowledge on obstetric and new-born danger signs

Generally, maternal knowledge of new-born danger signs was not satisfactory in the sample population. Results of this study shows that slightly above half (53.0%) of the mothers knew at least three new-born danger signs. Knowledge on key new-born danger signs aside from high body temperature, diarrhoea, and excessive crying was unsatisfactory. Findings of this study are similar to findings of a study carried out in the Savelugu Municipality in the northern region (Saaka and Iddrisu, 2014) and in eastern Ethiopia (Hailu, et al., 2010). A review of literature has shown that mothers' knowledge of new-born care issues may be a critical determinant of good practices.

Despite the fact that maternal knowledge of new-born danger signs was positively associated with odds of good neonatal feeding, slightly above half of the women were knowledgeable on new-born danger signs. This implies about half of the women lacked adequate knowledge of good new-born care practices which could badly affect their new-born care practices. One can conjecture that the low maternal knowledge could be ascribed to inadequate/ lack of messages received on new-born care practices at the ANC and Child Welfare Clinics.

There is therefore the need for a tailored health education on new-born care practices during antenatal care and postnatal care periods to improve on the knowledge levels of mothers and hence their ability to adopt acceptable new-born care behaviours.

Overall, mothers' knowledge of pregnancy danger signs was extremely low. Slightly over one-third (36.3%) of the sample women could mention at least three danger signs of pregnancy. This study finding is comparable to a study in southern Ethopia (Hailu et al., 2010) period) and rural Tanzania (Pembe et al., 2009) in which womens' knowledge on pregnancy danger signs were reported to be low.

This study observed that women who made at least four ANC visits during their last pregnancy were two times more likely have higher knowledge of danger signs of pregnancy compared to their counterparts who did not make four ANC visits. Also, women who attained at least senior high school education, and women aged 25-34 years were more knowledgeable of pregnancy danger signs compared to women with no formal education and women under 25 years of age respectively. These findings are similar to a similar study in rural Tanzania in which it was reported that mothers with at least secondary education, number of antenatal visits (at least four visits) as well as increasing age of the mother increased the likelihood of the mother's awareness of obstetric danger signs (Pembe et al., 2009).

The extremely low knowledge levels of mothers of pregnancy danger signs observed in this study calls for an integration of key messages of pregnancy dangers signs into ANC health education and counselling to avoid preventable pregnancy related complications.

CHAPTER SIX
CONCLUSIONS AND RECOMMENDATIONS

6.1 Main Findings

The main objective of the study was to assess the relationship between prenatal care utilization and the adoption of essential new-born care practices in the Kassena-Nankana Municipality of the Upper East region. The study analyzed and presented data specifically on the prevalence of essential new born practices as recommended by the WHO, association between prenatal care utilization and essential new-born care practices, predictors of essential new-born care practices, and maternal knowledge of pregnancy obstetric danger signs and new-born danger signs. The main findings of the study are summarized below:

i. The prevalence of essential new born practices as recommended by the WHO was generally low as only 37 (6.2%), 214 (35.7%) and 398 (66.3%) of respondents were judged to have had safe cord care, optimal thermal care and adequate neonatal feeding respectively.

ii. Adequacy of prenatal care utilization was significantly associated with only good neonatal feeding practices. However, attendance of antenatal care of four or more times was not associated with good neonatal feeding but timely initiation of first ANC visit was positively associated with good neonatal feeding practices.

iii. In multivariable logistic regression analysis, delivery at a health facility was the only independent variable that predicted optimal thermal care for the neonate and it alone accounted for 16.0 % of the variance in optimal thermal care (Nagelkerke R Square = 0.16)

iv. Women who delivered at a health facility and women who had adequate ANC visits (at least four visits) were less likely to practice safe cord care.

v. Generally, maternal knowledge of new-born danger signs was not satisfactory in the sample population. Results of this study showed that slightly above half (53.0%) of the mothers knew at least three new-born danger signs. Knowledge on key new-born danger signs aside from high body temperature, diarrhoea, and excessive crying was unsatisfactory.

6.3 Conclusion

The prevalence of essential new-born care practices as recommended by the World Health Organization was generally low in the Kassena-Nankana municipality, reminiscent of the fact that, most new-borns do not have access to neonatal and new-born care interventions.

Attendance of antenatal care of four or more times in the study area was not associated with essential new-born care practices. This has important implications for the implementation of the policy of focused ANC.

Predictors of essential new-born care practices in the Kasena-Nankana municipality included factors such as uptake of prenatal care services, presence of skilled birth attendant (SBA), maternal age, level of maternal education and knowledge of 3 danger signs during pregnancy.

Finally, adequacy of prenatal care utilization was significantly associated with only good neonatal feeding practices but not safe cord care and optimal thermal care, suggestive of the fact that antenatal care counseling package lack key messages on cord care and optimal thermal care practices.

6.4 Recommendations

There is the need for Ghana Health Service in the Kassena-Nankana Municipality to integrate key messages on safe cord care, optimal thermal care and good neonatal feeding into its ANC counselling package.

Ghana Health Service (GHS) and other stakeholders should roll out community-based interventions on new-born care as most of the neonatal deaths occur at the community level. There is the need for a strengthened collaboration between health facilities and the communities for timely referral and handling of potential risk factors which usually result into deaths.

6.5 Policy Implications

Overall, the findings show that adequacy of prenatal care utilization was significantly associated with only good neonatal feeding practices. Antenatal care attendance of at least four times was not associated with good neonatal feeding and negatively associated with new-born care practice like safe cord care. However, timely initiation of first ANC visit was positively associated with good neonatal feeding practices. Ideally, it was expected that women who had adequate antenatal care would report better new-born care practices. This implies that antenatal care is not delivering on the desired essential new-born care practices and has implications on the policy of focused antenatal care. It is therefore recommended that health education on the need for early ANC attendance should be strengthened and promoted by GHS and other stakeholders.

It has been further observed in this study that maternal knowledge plays a very critical role on new-born care practices. However, the proportion of mothers who had adequate

knowledge in new-born danger signs was unsatisfactory. This may be due to inadequate messages received during ANC sessions on new-born care practices.

There is therefore the need for a tailored health education on new-born care practices to be integrated into routine ANC services to raise the knowledge and adoption of essential new-born care practices.

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APPENDICES

Appendix 1: Survey Questionnaire

UNIVERSITY FOR DEVELOPMENT STUDIES

GRADUATE SCHOOL, TAMALE

MPhil. COMMUNITY HEALTH AND DEVELOPMENT

THE RELATIONSHIP BETWEEN PRENATAL CARE AND THE ADOPTION OF ESSENTIAL NEW BORN CARE PRATICES IN THE KASSENA-NANKANA MUNICIPALITY OF THE UPPER EAST REGION

Informed Verbal Consent

Good morning/afternoon. My name is _____, an MPhil Community Health and Development student from the University for Development Studies, Tamale. I am currently conducting a survey to assess the relationship between prenatal care and the adoption of essential new born care practices in the Kassena Nankana Municipality.

You were selected by chance to participate in the survey and I would like to ask you some few questions. All answers that you give will be confidential and used for only academic purposes.

You don't have to be in the survey, but we hope you will agree to answer the questions since your views are important. If I ask you any question you don't want to answer, just let me know and I will go on to the next question or you can stop the interview at any time. The interaction will take about 45 minutes to complete.

May 1 begin the interview now? 1. Yes 2. No

Section A: Introduction

Date..... Cluster Number.....

Name of respondent..... Community.....

Questionnaire no..... Interviewer's name.....

Section B; Maternal Socio-demographic Characteristics			
B1	Name of mother/caregiver.....		
B2	Age of mother.....	Age (in completed years) __ __	
B3	What is your educational status	No Education.....0 Primary school.....1 JSS/JHS.....2 Secondary school.....3 Tertiary 4	
B4	What is your occupation	Unemployed/Housewife.....1 Farming.....2 Seamstress.....3 Salaried worker.....4	

B5	Marital status of respondent	Single.....1 Married.....2 Divorced.....3 Widowed.....4 Other (specify).....5	
B6	Ethnicity.....		
B7	Age of Index Child.....	Age (in completed months)_____	
B8	Sex of index child	Male.....1 Female.....2	
B9	Birth weight of index child	Weight (in kilogrammes) __.__	

Section C: Maternal and New-born care			
C1.	Did you seek antenatal care during your last pregnancy?	Yes.....1 No..... 2	
C2	Where did you receive antenatal care during your last pregnancy?	Government Hospital.....1 Government Health Centre.....2 CHPS compound.....3 Private Clinic.....4 Other (specify).....5	
C3	How many weeks or months pregnant were you when you first received antenatal care for your last pregnancy? *Record the answer as stated by respondent.*	Weeks ..... 1 Months..... 2 DK.....998	
C4	How many times did you receive antenatal care during your last pregnancy? *Probe to identify the number of times antenatal care was received. If a range is given, record the minimum number of times antenatal care received.*	Number of times.....__ __ DK.....98	
C5	Do you have an antenatal card?	Yes.....1 No..... .....2 Don't know.....3	
C6	Can I see your antenatal card for your last pregnancy?	Card available.....1 Card not available.....2	
C7	During your antenatal care visit were you told about things to look out for that might suggest problems with the pregnancy?	Yes.....1 No.....2 Don't Know.....3	
C8	Can you mention some of the things that suggest problems with a pregnancy?	Bleeding.....1 Headache.....2 Swelling of feet, hands and	

	Multiple responses allowed	face.....3 Pallor .....4 Fever .....5 Abdominal pain.....6 Vomiting too much.....7 Don't Know.....8	
C9	Which of the following services did you received from ANC (Circle all that apply)	A. weight checked at least two times B. height taken on first visit C. blood pressure taken at least three times D. urine examination performed at least once E. blood sample examination performed at least once F. received health and nutrition talk at least four times on possible danger signs/complications of pregnancy G. received tetanus toxoid injection at least once H. received iron supplementation monthly I. Measurement of fundal height against the age of gestation, fetal heart beat and fetal movement count monthly J. Received Malaria prophylaxis at least two doses	
C10	What birth preparedness and complication readiness (BPACR) practices did you follow while pregnant with the index child?	A. identified a trained birth attendant for delivery B. identified a health facility for emergency C. arranged for transport for delivery and/or obstetric emergency D. saved money E. Others (specify).....	

C11	During your last pregnancy, were you given an injection in the arm to prevent the baby from getting tetanus, that is, convulsions after birth?	Yes.....1 No.....2 Don't Know.....3 ***If no, skip to C10***	
C12	During your last pregnancy, how many times did you get a tetanus injection?	Times..... ☐☐ Don't Know.....99	
C13	Before your last pregnancy, how many times did you receive a tetanus injection?	Times..... ☐☐ Don't Know.....99	
C14	During your last pregnancy, were you given or did you buy any iron tablets or iron syrup?	Yes.....1 No.....2 Don't Know.....3 ***If no, skip to***	
C15	During the whole pregnancy with (name), for how many days did you take the tablets or syrup?	Days..... Don't Know.....99	
C16	During your pregnancy with (name), did you take any drugs to keep you from getting malaria?	Yes.....1 No.....2 Don't Know.....3 ***If no, skip to***	
C17	What drugs did you take? *Circle all medicines taken. If type of medicine is not determined, show typical anti-malarial to respondent.*	SP/FANSIDAR . . . .1 Chloroquine . . ..2 Other (Specify).....3 DK.....4	
	Check C14 for medicine taken: *SP / Fansidar taken. ⇨ Continue with C15.* SP / Fansidar not taken.⇨ Go to C17.		
C18	How many times in total did you take SP/Fansidar when you were pregnant with (name). *Please include all that you obtained either during an antenatal care visit, during a visit to a health facility or from another source?*	Times..... DK.....99	

C19	Who assisted with the delivery of (*name*)? *Probe:* ANYONE ELSE? *Probe for the type of person assisting and circle all answers given.* If respondent says no one assisted, probe to determine whether any adults were present at the delivery.	***Health professional:*** Doctor.....1 Nurse / Midwife.....2 Auxiliary midwife.....3 ***Other person*** Traditional birth attendant.....4 Community health worker.....5 Relative / Friend.....6... Other (*specify*) _____ No one.....7	
C20	Where did you give birth to (name)? *Probe to identify the type of source* *If unable to to determine whether public or private,* *Write the name of the place.* _____ *(Name of Place)*	***Home*** Respondent's home.....11 Other home.....12 ***Public sector*** Government hospital.....21 Government clinic / health centre.....22 Government health post.....23 Other public (*specify*) _____ ***Private Medical Sector*** Private hospital.....31 Private clinic.....32 Private maternity home.....33 Other private medical (*specify*) _____ Other (*specify*)	
C21	When (name) was born, was s/he very large, larger than average, average, smaller than average, or very small?	Very large.....1 Larger than average.....2 Average.....3 Smaller than average.....4 Very small.....5 DK.....8	
C22	What was (name) birth weight? *If a card is available, record weight from card.*	From card.....1 (kg) __ . __ __ From recall.....2 (kg) __ . __ DK.....98	
C23	Did you ever breastfeed (name)	Yes.....1 No.....2	

C24	Is your child currently breastfeeding?	Yes.....1 No.....2	
C25	How long after birth did you first put (name) to the breast? If less than 1 hour, record '00' hours. If less than 24 hours, record hours. Otherwise, record days.	Immediately.....00 Hours.....1 __ __ Days.....2 __ __ DK/ Don't Remember.....99	
C26	In the first three days after delivery, was (name) given anything to drink other than breast milk?	Yes.....1 No.....2 Don't Remember.....3	
C27	What was (name) given to drink? Probe: Anything else	Milk (other than breast milk)....1 Plain water.....2 Sugar or glucose water.....3 Gripe water.....4 Sugar-salt-water solution.....5 Fruit juice.....6 Infant formula.....7 Tea / Infusions.....8 Honey.....9 Other (*specify*) _____	
C28	How many times do you feed the child with other food apart from breast milk in a day?	Once.....1 Twice .....2 Three times.....3 Other (specify.....4	

INFANT AND CHILD FEEDING PRACTICES

1. Is child currently eating other foods apart from breast milk?

   A. Yes
   B. No

2. If yes, when did you start complementary feeding?.....

3. How many times do you feed the child with other food apart from breast milk in a day?

A. Once
B. Twice
C. Three times
D. Other (specify).....

4a. Please, mention all the foods and drinks that were eaten by (Name of child) over the past 24 hours whether at home or outside the home. (Hint: start with meal eaten at supper yesterday).

Eating moment	Name of dish	Ingredients
Breakfast		
Snack before lunch		
Lunch		
Snack before dinner		
Dinner		
Snack after dinner		
Drinks		

4b. From the meals mentioned by the mother, indicate whether (Name of child), ate from the following food groups during the past 24 hours whether at home or outside the home.

Food group	Examples	YES	NO
CEREALS	Bread, noodles, biscuits, any other food made from millet, sorghum, maize, rice, wheat.		
WHITE TUBERS AND ROOTS	White potatoes, white yam, cassava, or food made from roots.		
DARK GREEN LEAFY VEGETABLES	Dark green leafy vegetables, including wild ones + other locally available vitamin-A rich leaves such as cassava leaves, ayoyo, alefu, bra, fresh baobab leaves etc.		
VIITAMIN A RICH VEGETABLES AND TUBERS	carrots, sweet potatoes that are orange inside + other locally available vitamin –A rich vegetables (e.g. Sweet pepper)		
FRESH VITAMIN A RICH FRUITS	Ripe mangoes, papayas, dawadawa pulp (yellow part) + other locally available vitamin-A rich fruits		
DRIED FRUITS AND VEGETABLES	Any form of dried vegetables (okro, baobab leaves (kuuka), wild types		
ORGAN MEAT (IRON-RICH)	Liver, kidney or other organ meats or blood-based foods		
FLESH MEATS	Beef, pork, lamb, goat, rabbit, wild game, chicken, duck, or other birds		
EGGS	fowl, duck, guinea fowl or any other egg		
FISH	keta schoolboys (anchovies), tilapia, mudfish etc		
LEGUMES, NUTS, AND SEEDS	Beans, pigeon peas, soya beans, groundnuts, bambara nuts, bungu, neri,		
MILK AND MILK PRODUCTS	Milk, cheese (wagashi), yogurt or other milk products		
OILS AND FATS	groundnut oil, palm oil, sheabutter, margarine		
SPICES CONDIMENTS, BEVERAGES	Spices (black pepper, salt), condiments(e.g.dawadawa, kanton, maggi),coffee, tea, alcoholic beverages e.g. pito		

Section E: Child Health and Nutrition

E1	Do you have a card where (NAME)'s vaccinations are written down? If yes, May I see it please?	Yes, Seen.....1 Yes, Not seen.....2 No card.....3	
E2	Copy Dates from the Card and Write '44' In 'Day' Column if Card Shows that a Dose was Given, but no date s Recorded.	dd/ mm/ yyyy BCG ..... Polio 0 (at birth)..... Polio 1..... Polio 2..... Polio 3.....	
		DPT1..... DPT2..... DPT3..... Measles..... Vitamin A (Most recent).....	
E3	Please tell me if (NAME) had any of the following vaccinations: A BCG vaccination against tuberculosis, that is, an injection in the arm or shoulder that usually causes a scar?	Yes.....1 No.....2 Don't Know.....3	
E4	Polio vaccine, that is, drops in the mouth?	Yes.....1 No.....2 Don't Know.....3	
E5	Was the first polio vaccine given in the first two weeks after birth or later?	First two weeks.....1 Later.....2 Don't Know.....3	
E6	How many times was the polio vaccine given?	Number of times.....	
E7	A DPT vaccination, that is, an injection given in the thigh or buttocks, sometimes at the same time as polio drops?	Yes.....1 No.....2 Don't Know.....3	
E8	How many times was the DPT vaccination given?	Number of times.....	
E9	A measles injection or an MMR injection - that is, a shot in the arm at the age of 9 months or older to prevent him/her from getting measles?	Yes.....1 No.....2 Don't Know.....3	

E10	Did (name of child) drink anything from a bottle with a nipple during the past 24 hours?	Yes.....1 No.....2	
E11	Has (NAME) had diarrhea in the last 2 weeks?	Yes.....1 No.....2 Don't Know.....3	
E12	When (name of child) had diarrhoea, what treatment, if any, did you give?	Nothing.....1 ORS.....2 Sugar-salt solution.....3 Infusion at the hospital.....4 Other (specify..... ..... Not Applicable (Child had no diarrhoea) 6	
E13	Now I would like to know how much (NAME) was given to drink during the diarrhoea(including breast milk) Was he/she given less than usual to drink, about the same amount, or more than usual to drink? IF LESS, PROBE: Was he/she given much less than usual to drink or somewhat less?	Much Less . . . .1 Somewhat Less .....2 About The Same..... 3 More . . . .4 Nothing To Drink.....5 Don't Know 8	
E14	When (NAME) had diarrhea, was he/she given less than usual to eat, about the same amount, more than usual, or nothing to eat? IF LESS, PROBE: Was he/she given much less than usual to eat or somewhat less?	Much Less . . . .1 Somewhat Less .....2 About The Same..... 3 More . . . .4 Stopped Food.....5 Never Gave Food.....6 Don't Know 8	

Section F: Essential New-born Care Practices			
F1	What Instrument was used to cut the umbilical cord of (name)?	New blade.....1 Old or unboiled blade.....2 Scissors.....3 Others (specify).....4	
F2	What material was used to tie umbilical cord of (name)?	Thread.....1 Cord tie.....2 Cord clamp.....3 String.....4 Others (specify).....5	
F3	What was applied to cord of (name)?	Nothing..... 1 Oil/shea butter.....2 Methylated Spirit.....3 Shea butter with powder.....4 Ointment.....5	
F4	If something was applied, what is the reason for applying that?		
F5	How long did it take before (name) was wrapped after delivery?	Less than 5 minutes.....1 5 to 10 minutes.....2 More than 10 minutes.....3 Unknown.....4	
F6	How long did it take before (name) was first bathed after delivery?	Soon after delivery.....1 1 to 6 hours.....2 More than 6 hours but less than.....3 24 hours .....4 More than 24 hours.....5 Cannot tell.....6	
F7	How long did it take before (name) was put to the breast after delivery?	Within 30 minutes.....1 During the first 1 hour.....2 2–8 hours.....3 The next day.....4 Do not remember.....5	
F8	When you delivered (name), was else was given to him/her aside breast milk?	Water.....1 Colostrum .....2 Waligu (spiritual water).....3 Mogu (herbal concoction).....4 Others.....5	

F9	When you delivered (Name of child) what did you do with the first yellowish breast milk?	Gave it to the baby.....1 Discarded it/spilled it.....2 Don't know 3	
F10	Within the last 24 hours what else has (name of child) taken/drunk in addition to breast milk?		
F11	Within the last one month, what else has (name of child) taken/drunk in addition to breast milk?		

Section G: Maternal Knowledge on New-born Danger Signs			
G1	What are some of signs that shows all is not well with your infant (0-12 months)	Poor sucking/ not sucking.....1 Convulsion.....2 Difficulty in breathing/ noisy breathing.....3 Baby looking blue or the lips are dark looking or palms dark looking.....4 Sleeps too much and hard to wake up.....5 Hot body (fever).....6 Cold body.....7 Cord is red or draining pus or redness around the cord.....8 Skin sores or boils on the skin.....9 Eye discharge.....10 Yellow eyes and skin.....11 Small baby.....12	

SECTION H: SOCIO-ECONOMIC HOUSEHOLD WEALTH INDEX OF *RESPONDENT*

INTRUCTION: These questions should be asked in the house of the respondent

G1. What type of house do members of the household dwell in?

1. Block house
2. Brick house
3. Mud house
4. Others (specify).....G2. Does the household own a house?

1. Yes
2. No

G3. How many rooms does the household have at their disposal? .....

G4. What kind of toilet facility do members of the household usually use?

1. Own flush toilet
2. Public or shared flush toilet
3. Own pit toilet
4. Public or shared pit toilet
5. No facility

G5. What is the source of lighting for the household?

1. Electricity
2. Gas
3. Kerosene
4. Others (specify) .....

G6. What type of fuel does your household mainly use for cooking?

1. Electricity
2. LPG
3. Charcoal
4. Kerosene
5. Firewood
6. Others (Specify).....

G7. What is the main source of drinking water for members of the household?

1. Pipe water
2. Borehole
3. Dug well
4. Bottle /Sachet water
5. Others (specify).....

G8. Does your household have any of these assets? (Tick Yes or No)

ITEM	YES	NO
Radio		
Color /black TV		
Satellite dish		
Sewing Machine		
Mattress		
Refrigerator		
DVD/VCD		
Computer		
Electric Fan		
Mobile Telephone		
Bicycle		
Motorcycle/Tricycle		
Animal-drawn cart		
Car/truck		

SECTION H: ANTHROPOMETRIC ASSESSMENT OF INDEX CHILD

I. Name of child: _____

II. Date of birth: ___/___/____

III. Age.....(months)

IV. Sex of child.....

V. Weight of child: __ __.__(kg)

VI. Height of child: __ __ __ .__ (cm)