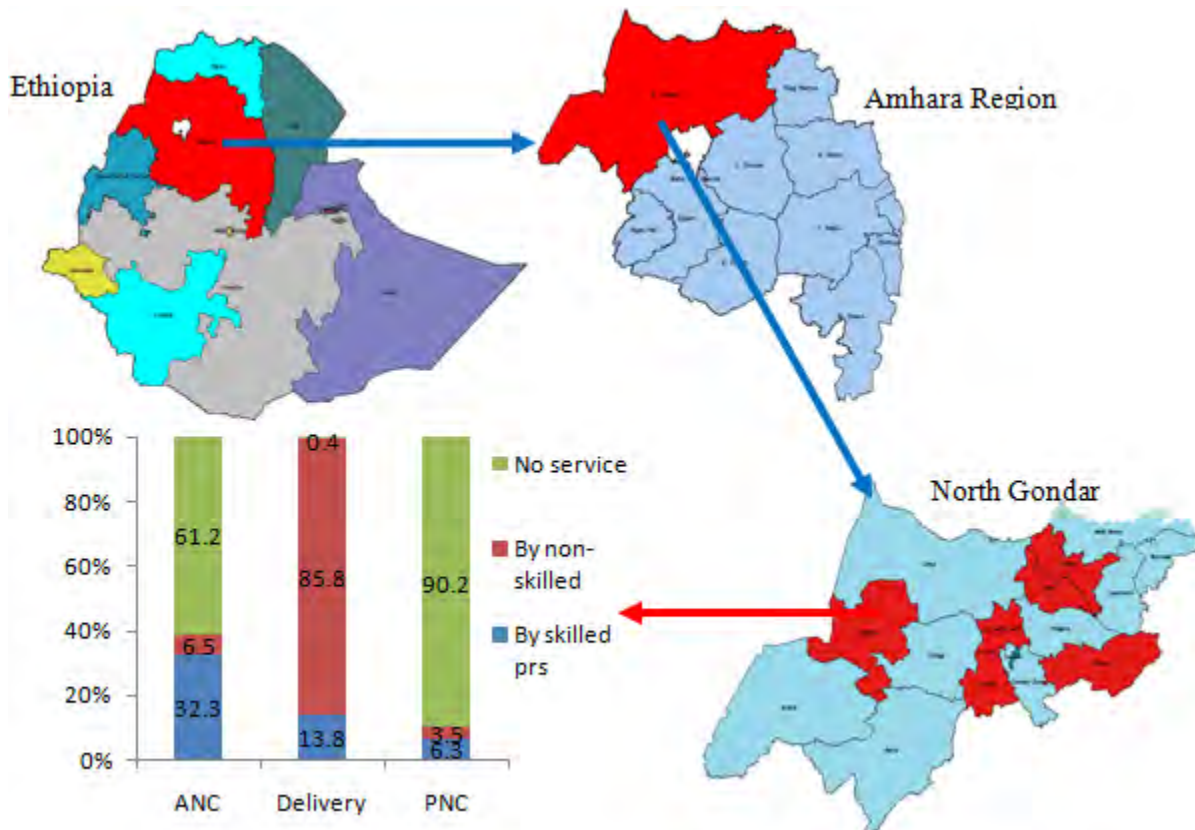




DETERMINANTS OF SKILLED MATERNAL CARE UTILIZATION: A MULTILEVEL ANALYSIS USING MIXED METHOD INVESTIGATION IN NORTH GONDAR ZONE, NORTH WEST ETHIOPIA

ABEBAW GEBEYEHU WORKU



PhD DISSERTATION FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY (PhD) IN PUBLIC HEALTH

ADDIS ABABA UNIVERSITY, ETHIOPIA

September 2013



**ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES**

**DETERMINANTS OF SKILLED MATERNAL CARE UTILIZATION: A
MULTILEVEL ANALYSIS USING MIXED METHOD INVESTIGATION IN
NORTH GONDAR ZONE, NORTH WEST ETHIOPIA**

**A DISSERTATION SUBMITTED TO THE SCHOOL OF GRADUATE
STUDIES OF ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY (PhD) IN PUBLIC HEALTH**

**BY
ABEBAW GEBEYEHU WORKU**

**SUPERVISORS
Dr. ALEMAYEHU WORKU
Prof. MESGANAW FANTAHUN
Prof. HENRY MOSLEY**

**ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES,
SCHOOL OF PUBLIC HEALTH**

September 2013

DISSERTATION APPROVAL

**ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES**

**DETERMINANTS OF SKILLED MATERNAL CARE UTILIZATION: A
MULTILEVEL ANALYSIS USING MIXED METHOD INVESTIGATION IN
NORTH GONDAR ZONE, NORTH WEST ETHIOPIA**

BY

ABEBAW GEBEYEHU WORKU

**SCHOOL OF PUBLIC HEALTH, ADDIS ABABA UNIVERSITY
APPROVED BY THE EXAMINING BOARD**

Chairman, Examining Board

Signature and date

Primary Supervisor

Signature and date

Secondary Supervisor

Signature and date

External Examiner

Signature and date

Internal Examiner

Signature and date

Internal Examiner

Signature and date

Original Papers

This dissertation is based on the following five papers, which will be referred to in the text by their Roman numerals:

- I. Worku AG, Yalew AW, Afework MF. Most women do not seek maternal care for normal conditions: The experiences of rural women in North Gondar, Ethiopia. (Under review the Pan African Medical Journal)
- II. Worku AG, Yalew AW, Afework MF. Maternal Complications and Women's Behavior in Seeking Care from Skilled Providers in North Gondar, Ethiopia. PloS one. 2013;8(3).
- III. Worku AG, Yalew AW, Afework MF. Availability and components of maternity services according to providers and users perspectives in North Gondar, northwest Ethiopia. BMC Reproductive Health 2013; 10:43.
- IV. Worku AG, Yalew AW, Afework MF. Factors affecting utilization of skilled maternal care in Northwest Ethiopia: a multilevel analysis. BMC International Health and Human Rights. 2013;13(1).
- V. Worku AG, Yalew AW, Afework MF. The Contributions of Maternity Care to Reducing Adverse Pregnancy Outcomes: A Cohort Study in Dabat District, Northwest Ethiopia. Matern Child Health J. 2013.

Acronyms and Abbreviations

AAU	Addis Ababa University
AIDS	Acquired Immuno Deficiency Syndrome
ANC	Antenatal Care
AOR	Adjusted Odds Ratio
CDC	Center for Disease Prevention and Control
CI	Confidence Interval
COR	Crude Odds Ratio
CSA	Central Statistical Agency
DHRC	Dabat health and Research Center
DHS	Demographic Heath Survey
EDHS	Ethiopia Demographic Heath Survey
EmOC	Emergency Obstetric Care
EOC	Essential obstetric care
FANC	Focused antenatal care
FMOH	Federal ministry of health
GDP	Gross domestic product
HDSS	Health and Demographic Surveillance System
HEWs	Health Extension Workers
HIMS	Health Information Management System
HIV	Human Immunodeficiency Virus
IP	Infection prevention
IRB	Institutional Review Board
IUGR	Intra Uterine Growth Retardation
LBW	Low Birth Weight
LSS	Life saving skills
MDGs	Millennium development goals
MVA	Manual vacuum aspiration
NGOs	Nongovernmental Organizations
OR	Odds Ratio
PAC	Post Abortion Care

PCA	Principal Component Analysis
PI	Principal Investigator
PIH	Pregnancy Induced Hypertension
PMTCT	Prevention of mother to child transmission of HIV
PNC	Postnatal Care
PROM	Premature Rupture of Membrane
RR	Relative Risk
SBAs	Skilled Birth Attendants
SD	Standard Deviation
SNNPRS	Southern Nations, Nationalities, and Peoples Regional State
SPSS	Statistical Package for the Social Sciences
STIs	Sexually Transmitted Infections
TBAs	Traditional Birth Attendants
UN	United Nations
UNDP	United Nations Development Program
UNICEF	United Nations International Children's Emergency Fund
VCT	Voluntary counseling and testing
VIF	Variance Inflation Factor
WHO	World Health Organization

Glossary of Operational Definitions and Concepts

Basic signal functions: include parenteral antibiotics, anticonvulsants and oxytocics, manual removal of placenta, removal of retained products, assisted vaginal delivery and neonatal resuscitation (at basic emergency obstetric care facility)

Comprehensive signal functions: refers basic signal functions with the addition of cesarean delivery and blood transfusion (at comprehensive emergency obstetric care facility) (1).

Early neonatal mortality: is a neonatal death in the first week of life.

Eclampsia: represented by occurrence of convulsions.

Enabling environment: In the context of safe motherhood, describes a context that provides a skilled attendant with the backup support to perform routine deliveries and make sure that women with complications receive prompt emergency obstetric care. It essentially means a well-functioning health system, including equipment and supplies; infrastructure and transport; electrical, water and communication systems; human resources policies, supervision and management; and clinical protocols and guidelines.

Hemorrhage: Can be antepartum or postpartum

- **Antepartum hemorrhage:** refers severe bleeding before and during labour: placenta praevia, placental abruption
- **Postpartum hemorrhage:** refers to any of the following; postpartum bleeding that requires treatment (e.g. provision of intravenous fluids, uterotonic drugs or blood), retained placenta, severe bleeding from lacerations (vaginal or cervical), vaginal bleeding in excess of 500 ml after childbirth and more than one pad soaked in blood in 5 minutes.

Maternal death: is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes (2).

Maternal mortality ratio: refers the number of maternal deaths in a year per 100,000 live births during the same year. It measures the risk of maternal death among pregnant or recently pregnant women.

Maternal (obstetric) complications: refers maternal morbidities suffered during pregnancy through the postpartum period of 42 days and that may directly cause maternal deaths. Obstetric or maternal complications are acute conditions including antepartum or postpartum hemorrhage,

prolonged or obstructed labor, postpartum sepsis, complications of abortion, pre-eclampsia/eclampsia, ectopic pregnancy, and ruptured uterus (3).

Neonatal mortality: is death of a neonate in the first month of life.

Non-skilled attendants: refers maternal care providers who are not trained to proficiency in the skills necessary to manage or refer obstetric complications. Non-skilled attendants include TBAs (trained or untrained), relatives and other community workers with brief health training.

In this study, the TBAs (trained or untrained), relatives and HEWs are categorized under non-skilled providers.

Skilled maternal care (or skilled care): refers to the care provided to a woman and her newborn during pregnancy, childbirth and immediately after birth by an accredited and competent health care provider (skilled attendant) that can be provided at different levels (home, health centers or hospitals) (4, 5).

Skilled attendants

A skilled birth attendant is medically qualified provider with midwifery skills (midwife, nurse or doctor) who has been trained to proficiency in the skills necessary to manage normal deliveries and diagnose, manage, or refer obstetric complications (6).

Midwifery skills are a defined set of cognitive and practical skills that enable the individual to provide basic health care services throughout the continuum of pregnancy, childbirth and postnatal period and to provide first aid for obstetric complications and emergencies, including life-saving measures when needed (6). In this study, midwives, nurses, health officers and doctors including obstetricians were considered as skilled providers.

The principal categories of skilled attendants include:

- 1. Midwives (including nurse-midwives):** Persons who, having been regularly admitted to an educational program duly recognized in the country, in which it is located, have successfully completed the prescribed course of studies in midwifery and acquired the requisite qualifications to be registered and/or legally licensed to practice midwifery.
- 2. Nurses with midwifery skills:** refers nurses who have acquired midwifery knowledge and skills either as a result of midwifery being part of their nursing curricula or through special post basic training in midwifery.

3. **Health officers with midwifery skills:** are those trained for four years to get their Bachelors degree and they work as clinician in the rural set up (health centers). They acquired midwifery knowledge and skills as a result of midwifery being part of their curricula
4. **Doctors with midwifery skills:** refers medical doctors who have acquired competency in midwifery skills through specialist education and training, either during their pre-service education or as part of a post-basic program of studies.
5. **Obstetricians:** refers medical doctors who have specialized in the medical management and care of pregnancy and childbirth and in pregnancy-related complications, but not usually complications of the newly born infant. They have usually undergone additional education and clinical training to acquire these additional skills and have been certified or accredited in obstetrics.

Perinatal mortality refers to the deaths of fetus after time of viability (stillbirth) and neonatal mortality in the first week of life. For international comparisons, WHO recommends reporting of stillbirths with birth weight of 1000 g or more, 28 weeks“ gestation or more, or a body length of 35 cm or more (7).

Post-neonatal mortality: is death of a neonate after one month and before one year of life.

Postpartum sepsis (infection) refers to fever for more than 24 hours after delivery and any one of the following signs and symptoms: lower abdominal pain, purulent, offensive vaginal discharge (lochia) and tender uterus. Definitions of complications were adopted from WHO guideline for monitoring emergency obstetric care (1).

Pregnancy-related death: refers death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death (2, 8).

Prolonged or obstructed labor (dystocia, abnormal labor): refers to any of the following; greater than 12 hours labor after first stage of labor, greater than 1 hours after second stage of labor, cephalo-pelvic disproportion and malpresentation (transverse, brow or face presentation) (1).

Users of skilled care: refers women who used skilled maternal care, care from a doctor, health officer, nurse, or midwife during their ANC, delivery, PNC and at the time of complications.

Table of Contents

Acronyms and Abbreviations	IV
Glossary of Operational Definitions and Concepts	VI
Table of Contents	IX
List of Tables	XI
List of Figures	XII
Abstract	XIII
I. Introduction	1
1.1. Statement of the Problem	1
1.2. Rationale of the Dissertation	2
1.3. Literature Review	3
Background information about maternal health problems and intervention areas	3
Skilled maternal care at different periods and conditions	6
Determinants of skilled maternal care utilizations	8
Individual and household level factors	9
Facility level factors	14
Community level factors	17
State/national level factors	18
1.4. Conceptual Framework	19
II. Research Questions and Objectives	21
III. Methods	22
3.1. Study Area and Setting	22
3.2. Study Design	25
3.3. Study Population and Sampling	25
3.4. Data Collection Tools and Procedures	29
3.5. Data Management and Analyses	31
3.6. Quality Assurance Mechanisms	34
3.7. Ethical Considerations	35
3.8. Tabular Summary of the Methods Applied in the Dissertation	37
IV. Results (Review of Main Findings in Manuscripts I–V)	38
4.1. Socio-Demographic Characteristics of the Study Subjects	40
4.2. Utilization of Skilled Maternal Services	43
4.3. Reasons for not Using Skilled Maternal Services	45
4.4. Availability and Components of Maternal Services	49

4.5. Factors Affecting Utilization of Skilled Maternal Care	54
4.6. The Contributions of Using the Available Maternity Services to Reduce Adverse Pregnancy Outcomes	57
V. Discussion	59
5.1. Utilization of Skilled Maternal Care	59
5.2. Determinants of Skilled Maternal Care.....	60
VI. Validity and Generalizability	67
VII. Strengths and Limitations	70
VIII. Conclusions.....	72
IX. Recommendations.....	73
Policy and Program Recommendations	73
Further Research	74
X. Acknowledgments.....	75
References.....	76

List of Tables

Table 1: Summary of methods based on objectives of the study.....	37
Table 2: Summary of main findings from the five manuscripts	38
Table 3: Frequency and percentage distribution of women involved in the population-based survey according to selected socio-demographic characteristics, North Gondar, 2012.....	41
Table 4: Frequency and percentage distribution of women involved in the follow-up study according to selected socio-demographic characteristics, Dabat, 2012	42
Table 5: Utilization of ANC, Delivery and PNC by skilled providers, North Gondar 2012.....	43
Table 6: Types of providers assisting mothers at the time of complications in their last birth one year preceding the survey, North Gondar 2012	45
Table 7: Major reasons for not using skilled maternal care based on unprompted responses of mothers who did not use the services, North Gondar, 2012.....	45
Table 8: Awareness and perceptions related to obstetric complications and the need for skilled maternal care among women having birth one year preceding the survey, North Gondar, 2012	47
Table 9: Availability of maternal services and laboratory tests in basic and comprehensive obstetric care facilities (selected health centers and all hospitals) in North Gondar, 2012	50
Table 10: Number and percentage of skilled providers getting training or on-the-job experience for different types of procedures, North Gondar, 2012	51
Table 11: Reports of skilled care providers performing the following procedures to women who present for maternity care in the past three months, North Gondar, 2012	52
Table 12: Essential services received by women during their ANC visits and delivery care by types of skilled attendants according to women's response, North Gondar, 2012	53
Table 13: Results of the multilevel analysis by predictors of skilled maternity care, North Gondar, 2012	55
Table 14: The effect of skilled maternal care on reducing occurrence of the complications and death during delivery and postpartum period without and with adjustment of possible confounders	58

List of Figures

Figure 1: Forest plot showing individual and pooled OR of studies on the strength of association between primary education and delivery services	10
Figure 2: Conceptual framework to review the pathway of determinant factors affecting utilization of skilled maternal care and maternal survival	20
Figure 3: (A) Map of Ethiopia showing regional states and city administrations, (B) Map of the Amhara region showing zones, and (C) Map of North Gondar zone showing woredas. The red colored maps indicate the study areas.	23
Figure 4: Map of Dabat district with study sites (the rose-colored kebeles).	24
Figure 5: Utilization of ANC, delivery and PNC services, North Gondar, 2012	44
Figure 6: The main reasons for not seeking assistance at the time of obstetric complications by using wealth quintiles, North Gondar 2012	46
Figure 7: Flowchart of the cohort study from exposure assessment to outcome ascertainment...	57

Abstract

Introduction

Historical and ecological evidences indicate that maternal care by skilled providers is one of the key strategies for maternal survival. However, the rate of maternal service utilizations and reduction of maternal mortality are very low in Ethiopia. Several factors, which vary according to different contexts and operate at different levels, can affect the utilization of skilled maternal care. Hence, a level-by-level analysis of all sources of poor skilled maternal care utilization has strategic relevance for the country.

Objective

This study was designed to describe skilled maternal care utilization and to identify associated factors operating at different levels

Methods

The study included a linked facility and population-based survey to assess the availability, utilization and correlates of maternal service utilization, and a prospective cohort study to evaluate the effect of the available skilled maternal care in reducing adverse pregnancy outcomes. The linked survey was conducted over three months (January - March 2012) in twelve randomly selected kebeles, their nearby twelve health centers, and three hospitals of North Gondar Zone, while the cohort study was conducted in 10 kebeles of Dabat district from December 1, 2011 to August 31, 2012 on 763 pregnant women. Data on potential correlates of skilled maternal care utilization were gathered using quantitative and qualitative data collection techniques. In the cohort study, data was collected at four time points: first contact, during the 9th month of pregnancy, within one week after delivery, and on the forty-second day of postpartum. During analysis, the effect of potential confounders was controlled using logistic regression models. The effect of cluster variation and a number of individual, communal (kebele), and facility-related variables for skilled maternal care utilization was examined using the multilevel modelling.

Results

All indicators of skilled maternal care service utilization were very low in North Gondar. Out of the total 1668 women, only 32.3%, 13.8%, and 6.3% utilized skilled providers for their routine

antenatal, delivery, and postnatal care, respectively. Most of these services were at health centers by nurses or midwives. Of the 476 women who faced complications, 248 (52.1%, 95% CI: 47.6%, 56.6%) sought assistance from a skilled provider.

Antenatal and delivery care were available in most of the visited facilities. However, important components of both the routine and emergency maternity services were incomplete. Signal functions including the administration of anticonvulsants and assisted vaginal delivery were missing in seven and five of the 12 health centers, respectively. The proportion of women according to the type of service they received at the time of their antenatal care was 79% (blood pressure checkup), 35% (urine testing), 45% (tetanus immunization), 64% (iron supplementation), 51% (birth preparedness counseling) and 71% (HIV testing). During delivery, only 24% of the providers used partograph consistently. In many of the facilities, important pieces of equipment were either absent or not functional. Most of the health centers also lacked laboratory tests, such as VDRL, hemoglobin, urine protein, and cross match. Interviewed midlevel providers had no adequate training on essential procedures like assisted vaginal delivery (vacuum extraction), manual vacuum aspiration, or evacuation and curettage. In addition, about one-third of the providers had no skill to manage preeclampsia and post-abortion complications.

The multilevel analysis showed a significant heterogeneity among clusters for each indicator of skilled maternal care utilization (ANC, delivery and PNC). At the individual level, preference for skilled providers and previous experience of antenatal care were consistently strong predictors of all indicators of skilled maternal care utilization. First birth order, maternal education, and awareness about health facilities to get skilled professionals were significantly associated with skilled antenatal and delivery care utilization. At this level, variables related to awareness and perceptions were more important. At communal and facility level; cost requirements at health facilities, having different sources of income to cover transport and service costs, and the availability of important service components at health facilities were among the factors affecting skilled maternal care, especially delivery service. Seeking skilled care for complications was significantly affected by wealth, ANC use, and the readiness of a woman for possible complications.

The follow-up study showed that the chance of the occurrence of adverse pregnancy outcomes was reduced by 9% (OR=0.91; 95% CI: 0.43, 1.69) among mothers with less than four ANC visits and by 25% (OR=0.75; 95% CI: 0.25, 2.75) among mothers with four or more ANC visits.

In addition, delivery by a skilled attendant showed a 31% (OR=0.69; 95% CI: 0.36, 1.33) reduction in the occurrence of complications and death during delivery and postpartum period. However, the findings were not significant. Providing incomplete service (poor quality of care) was considered as the major explanation for the insignificant effects.

Conclusions

Most women did not use skilled care for the routine antenatal, delivery, and postnatal care. Nearly half of the women who faced complications also did not seek skilled maternal care. Both the routine and emergency maternity cares lack the full components of important services. Lack of facilities in the health institution and deficiencies in the skills of providers were the major reasons for missing essential components of maternal services. In general, the utilization of skilled maternal care depends on the separate and joint effects of individual, communal, and health facility level factors. Beyond its effect on health-seeking behavior of mothers, providing incomplete (poor quality) maternal service was an obstacle to the achievement of the goals of reducing morbidity and mortality. Therefore, the available skilled maternal care showed an insignificant reduction in adverse pregnancy outcomes (complications and deaths).

Recommendations

In order to create better community awareness and perception about skilled providers and their care, safe motherhood education, especially on the risk of pregnancy and the benefits of skilled maternal care should be promoted using the available communication networks in the rural communities. Such interventions should target underprivileged women. ANC service should be expanded through outreach programs and domiciliary service to attain higher coverage in all types of skilled maternal care. Improving the quality of both the routine and emergency maternity services (providing important service components) is the most urgent intervention to achieve the goals of maternal health programs. Providing in-service training and the necessary equipment as well as ensuring continuum of care and monitoring the health facility using the signal functions in regular bases are the major activities for effective maternal care.

Key words: Skilled maternal care, Linked facility and population-based survey, Multilevel analysis, Adverse pregnancy outcomes, Dabat, North Gondar, Ethiopia

I. Introduction

1.1. Statement of the Problem

Many mothers living in developing countries continue to die from pregnancy related causes each year (9, 10). The maternal mortality ratio in Ethiopia is remarkably high and has stagnated at 676 per 100, 000 live births in 2011 without a significant change from its 2000 and 2005 level (11).

In Ethiopia, reducing maternal mortality is one of the goals of the Health Service Development Program of the country (12). Maternal and newborn health is also among the six priority areas in the reproductive health strategy (13). Historical analysis from European countries, like Sweden and Asian countries like Malaysia, Sri Lanka, and Thailand indicate that introducing skilled attendants (midwives) in the health care system significantly reduces maternal mortality (14, 15). Hence, providing maternal care by skilled health personnel is one of the key strategies to reduce maternal mortality.

As part of the strategies, Ethiopia plans to raise the number of skilled delivery to 65% by 2015 (12). However, the recent report of the Ethiopian Demographic and Health Survey (EDHS) of 2011 showed that only 34%, 10%, and 6% of women received antenatal care (ANC), delivery and postnatal care by skilled providers, respectively (11). Based on this pace, the country has little optimism to meet its target.

Several factors affect the utilization of skilled maternal care. Based on the global literature reviewed, they were categorized as, individual /household level, health facility and community level, and state/national level factors. Individual/household level determinants include socio-demographic factors (education, age, parity etc), service related knowledge and experience, women's autonomy and status (health care decision making capacity), involvement of husband and other family members and household wealth. Facility level factors include service providers (in terms of competence, number and type), access to and availability of maternal care facilities (like distribution, distance from the community, and referral system), facility readiness (in terms of availability of staff, technical guidelines and laws, essential drugs and supplies) and the performance or quality of facilities. Community level factors include availability & access to community infrastructure and resources, community traditions related to pregnancy and childbirth.

The national level factors are aggregated figures or indexes at the national level like, the level of education, health status, economic status and variables used directly like gross national income or GDP, government health expenditure and the presence or absence of national level health policies.

Depending on the indicators of maternal health services, the relevant determinants vary. Effective interventions to promote maternal health service utilization require targeting of the underlying individual, household, community and health facility (supply) level factors. Therefore, it is crucial to identify these factors in order to design interventions with respect to their relative roles. Thus, the current study is dedicated to assess the magnitude and correlates of skilled maternal care utilization indicators and their effects in reducing adverse pregnancy outcomes in North Gondar, Northwest Ethiopia.

1.2. Rationale of the Dissertation

According to historical and ecological evidences, skilled maternal care especially, skilled attendance at birth, can largely prevent maternal morbidity and mortality. However, low coverage and quality of services are the major challenges in many developing countries. In Ethiopia, skilled maternal care utilization is staggeringly low.

Skilled maternal care is influenced by complex factors, which require a systematic approach and appropriate methodology. Factors influencing maternal health service utilization operate at various levels, according to global literature.

Existing studies in Ethiopia have serious limitations in evaluating the determinants of skilled maternal care utilization. The evidence these studies provide is often based on the evaluation of either user or facility-related barriers without controlling the effect of the former or the latter or vice versa. Such evidence evolves from a population-based survey, like EDHS or a separate facility-based study. Addressing only one of these categories is likely to present a very incomplete picture for the evaluation of the determinants affecting maternal service utilization. Hence, not all factors affecting skilled maternal care utilization are analyzed accurately and according to their strategic relevance.

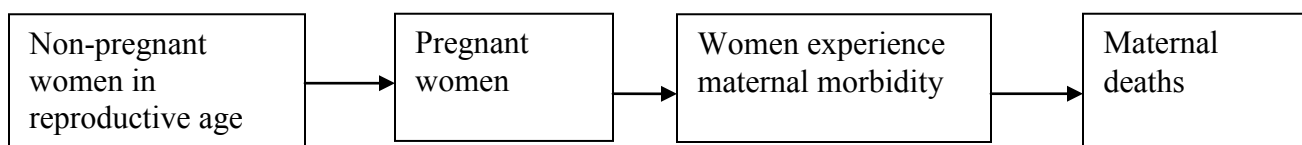
This study provided an opportunity for a more complete and accurate analysis of all potential variables to answer the question “Why is the utilization of skilled maternal care very low in Ethiopia?” The study utilized different data sources and an advanced analytic technique (a multilevel-multivariate analysis), after collecting all relevant data through a linked facility and population-based survey. In addition, a follow up study design was applied to evaluate the effect of current skilled maternal care (quality of care). The study indicated the areas of interventions at different levels for improving skilled maternal care.

1.3. Literature Review

Background information about maternal health problems and intervention areas

In sub-Saharan Africa, one in 16 women dies in pregnancy or childbirth. This risk is 175 times higher than that in developed countries (one in 2800) (16). Ethiopia is one of the countries with the highest maternal mortality ratio currently estimated at 676 maternal deaths per 100,000 live births without a significant change from its 2000 and 2005 levels (11). This EDHS estimate is considered best compared with the model-based estimates by World Health Organization (WHO) and World Bank.

A woman who dies because of pregnancy related causes, must pass through three consecutive stages as, pregnancy, maternal morbidity and mortality, each dependent upon the preceding stage (See the following flowchart) (17).



For every maternal death, about 20 more women are estimated to suffer from acute or chronic pregnancy related illnesses (16). Maternal morbidity includes all illnesses and complications associated with child bearing short of death, which can be acute or chronic condition. Some morbidity is instantaneously lethal, while others are potentially lethal, disabling, or simply discomforting (17). Acute maternal (obstetric) morbidity is a complication suffered during pregnancy through the postpartum period of 42 days that may directly cause maternal deaths.

Maternal death can follow shortly after a complication. The average interval between the onset of major obstetric complications and death, in the absence of medical interventions, is about two hours for postpartum hemorrhage, twelve hours for antepartum hemorrhage; one day for a ruptured uterus; two days for eclampsia; three days for prolonged labor, and six days for infection (puerperal sepsis) (1).

About 15% of women are expected to experience maternal complications (1). However, the risks of adverse pregnancy outcomes become higher among women with poor health, poor nutritional status, and unintended pregnancy. Women under 19 or over 39 years of age, and those on their first birth, as well as mothers with a previous history of fetal loss have greater risk of developing complications (18). Too narrow child spacing (birth to conception intervals of less than 6 months) results in a 150% increased risk of maternal death. Moreover, it elevates the risk of third trimester bleeding and premature rupture of membranes by 70%; puerperal endometritis by 30%, and anemia by 30% (19).

The three intervention areas to decrease maternal mortality are the reduction of the likelihood that a woman become pregnant; that a pregnant woman experience a serious complication of pregnancy or childbirth; or death among women who experience complications (17). In the three strategies, family planning, essential maternal care services for normal conditions and emergency obstetric care for complications, are the major safe motherhood programs.



In the first strategy, the prevention of too many or too narrow pregnancy, improving pre pregnancy health and nutritional status of the women through access to family planning services, education of women, access to basic health services and nutrition are some of the approaches to address problems related to pre pregnancy conditions (20, 21).

Once pregnancy occurs, maternal survival is mainly dependent on the presence of quality maternity care, for both normal and complicated conditions. In both the second and third strategies, the presence of skilled maternal care (skilled providers with enabling environment) is the critical intervention for the survival of the mother.

Since the majority of the complications are unpredictable, the presence of skilled providers is mandatory. According to this fact, “ensuring skilled care for all women during pregnancy, childbirth and the immediate postnatal period (skilled maternal care)” is one of the strategies to reduce maternal and newborn mortality recommended by the World Health Organization (22). Skilled maternal care requires health professionals with midwifery skills (skilled attendants) and the necessary equipment and functioning health system, including transport and referral facilities for emergency obstetric care (22).

Evidences on the success of skilled attendants

In the 19th century, maternal mortality halved in Sweden as a result of a national policy favoring professional midwifery care for all births, most of which took place at home. In Denmark, Japan, the Netherlands and Norway, similar strategies of maternity care produced comparable results. Malaysia, Sri Lanka and Thailand halved their maternal mortality ratios within 10 years by increasing the number of midwives in the 1950s and 1960s. Between 1983 and 2000, Egypt doubled the proportion of deliveries assisted by skilled birth attendants and reduced maternal mortality ratio by 50% (9, 23).

In addition, the national level analysis based on Demographic and Health Surveys (DHS) data showed a negative correlation between the proportion of deliveries attended by a skilled attendant (midwife, nurse or doctor) and maternal mortality ratio (24). Evidences also indicated that intra-partum related deaths occur in settings with weak health systems and low coverage of skilled birth attendance (25).

Some studies indicated that a higher coverage of skilled maternal care is required to have significant reduction in maternal mortality at the population level. For instance, skilled delivery attendance was not associated with significant reductions in maternal mortality or stillbirth rates until coverage rates of about 40% were achieved.

Similarly, four or more antenatal visits were not associated with significant reductions in maternal deaths until about 60% coverage was realized (26). This indicated that skilled maternal care would not have a significant impact in settings with low coverage, like Ethiopia where only 34%, 10%, and 6% of the women have ANC, delivery and postnatal care by skilled providers, respectively (11).

In sub-Saharan Africa, the correlation between skilled care and maternal mortality is not clear. DHS reports indicate that there are many sub-Saharan African countries with more than half of their deliveries with health professionals, but maternal mortality remains high (above 500 per 100,000 live births). Furthermore, a quasi-experimental study in Burkina Faso revealed that a significant improvement in the use of skilled birth attendance at birth did not show a significant reduction in pregnancy-related mortality in the study periods (27). Evidence suggested that the primary reason for insignificant reductions is the poor quality of care due to lack of the required skills and supporting health systems. Different guidelines recommended that skilled providers should include a mix of health professionals, mid-level health providers with midwifery skills for normal conditions, and higher-level professionals for complicated situations (28). All skilled attendants at all levels of the health system must have skills and abilities to perform all of the core functions (core midwifery skills as defined by the International Confederation of Midwives (22).

Skilled maternal care at different periods and conditions

Focused antenatal care (FANC): After the traditional ANC (the risk approach) has been criticized, the new approach, FANC, which emphasizes the quality of care rather than quantity is developed. The major goal of FANC is to help women maintain normal pregnancies through the identification of preexisting health conditions, early detection of complications arising during the pregnancy, health promotion, disease prevention, and birth preparedness and complication readiness planning (29). According to this new WHO antenatal care model, all pregnant women should have a minimum of four ANC assessments by or under the supervision of a skilled attendant. The first visit commences as early as possible in the first trimester (< 16 weeks), followed by second visit (20–24 weeks), third visit (28–32 weeks), and fourth visit (36 weeks) (30).

Delivery care: One of the most critical interventions identified for safe motherhood is ensuring that a health worker with midwifery skills is present at every birth, since most obstetric complications are difficult to predict, and any woman can suddenly develop a life-threatening emergency. The main goals include: 1) conducting clean and safe (atraumatic) delivery, and 2) early detection and management of complications. The use of the partograph to monitor labor progress and active management of the third stage of labor can ensure that life saving action is taken in a timely manner and help to prevent complications.

Skilled attendants can give delivery services at home, but the feasibility of home compared with facility-based delivery indicated that home deliveries encountered several constraints, including poor transportation, inappropriate environment for delivery, insufficient supplies and equipment, lack of security, and inadequate training and medical supervision, which may prevent the provision of skilled care. The pressure by families to adhere to traditional childbirth norms, and convincing such families to accept the need for referral are the other challenges (31).

Postpartum care: The postpartum period is defined as one hour following the delivery of the placenta through the first six weeks of an infant's life. The period immediately following delivery is a time of vulnerability to several life-threatening obstetric complications. It is indicated that having postpartum care at least during the first twenty-four hours and before the end of the first week would be the most effective strategy.

Management of obstetric complications: As noted in the definitions, skilled care providers should be able to diagnose a range of obstetric complications and perform procedures to manage or stabilize (and refer) such emergency complications. The major complications include the following; haemorrhage (antepartum or postpartum), prolonged/obstructed labour, postpartum sepsis, complications of abortion, preeclampsia/eclampsia, ectopic pregnancy and ruptured uterus (1). All skilled providers are expected to perform life saving procedures like management of complications of incomplete abortion, vacuum extraction, and manual removal of the placenta. Investment in emergency obstetric care and training of midwives to perform life saving procedures, like the management of complications of incomplete abortion, vacuum extraction, and manual removal of placenta are recommended in different studies (32).

The management of complications requires effective referral linkage and the availability of backup emergency obstetric care (EmOC) services functioning 24 hours a day and 7 days a week (33). If 15% of pregnant women are estimated to have obstetric complications (34), at least 15% of all births in the population should be managed in either basic or comprehensive EmOC facilities. It is recommended that facilities should do caesarean sections for not less than 5% nor more than 15% of all births in the population (1). Life-saving interventions or signal functions are provided to treat major obstetric complications in both basic and comprehensive EmOC facilities. The difference is that basic EmOC facilities provide basic signal functions including parenteral antibiotics, anticonvulsants and oxytocics, and the procedures of manual removal of the placenta, removal of retained uterine products, assisted vaginal delivery and neonatal resuscitation while comprehensive EmOC facilities provide comprehensive functions including the seven basic functions, cesarean delivery and blood transfusions (1).

Determinants of skilled maternal care utilizations

The term “determinants” is broadly used to describe all factors associated with the outcome of interest. Skilled maternal care utilization is influenced by a variety of factors, which operate their impact at different levels. At the higher level, for example, government policies and actions may not be conducive, or facilities may not be available. Even when facilities are available within a community, they may not be well equipped, or women may not use the services. At the level of the users, on the other hand, individual level factors, like maternal education, residence and awareness, as well as household level barriers, such as socio-economic inequalities and the status of women are very important explanations for such underutilization of maternal health services. Adopting a broad view like that of determinants has several advantages in that it places both outcomes and possible interventions in their social context thereby increasing the potential for success in various cultural settings and that it suggests more potential points of intervention with multiple health impacts.

Individual and household level factors

Maternal education

Maternal education is one of the known predictors of maternal service utilization in many developing countries. It is positively associated with all the three indicators of maternal services, antenatal, delivery, and postnatal care. A meta-analysis finding using data from the most recent demographic and health surveys conducted in 31 developing countries indicated that women who have completed primary education are almost five times more likely to have had a skilled birth attendant at delivery (pooled Odds Ratio (OR): 4.89, 95% CI, 4.34, 5.52) than less educated women (35).

Studies conducted in different parts of Ethiopia revealed that maternal education is positively associated with maternal service utilization. The EDHS findings indicated that women, especially those with secondary school education had enormous benefits in terms of access to skilled birth attendance in Ethiopia. Analyses based on the 2005 (36) and 2000 (37) EDHS as well as some pocket studies done at Mekele (38), Afar (39), Dabat (40), Mota (41), South West Shoa (42), Harari (43) and South Omo (44) showed positive and significant associations between primary education and delivery service utilization. However, a study done on a relatively large sample in the north western part of the country (45), and some MPH theses conducted at Sheka (46), Jimma (47), Dabat (48) and Arsi (49) indicated positive but insignificant associations. The meta-analysis estimation of these 14 studies in the country indicated that woman with primary education use delivery services 1.7 times more likely than uneducated (illiterate) women (pooled OR: 1.73, 95% CI, 1.47, 1.99). (See the forest plot in Figure 1)

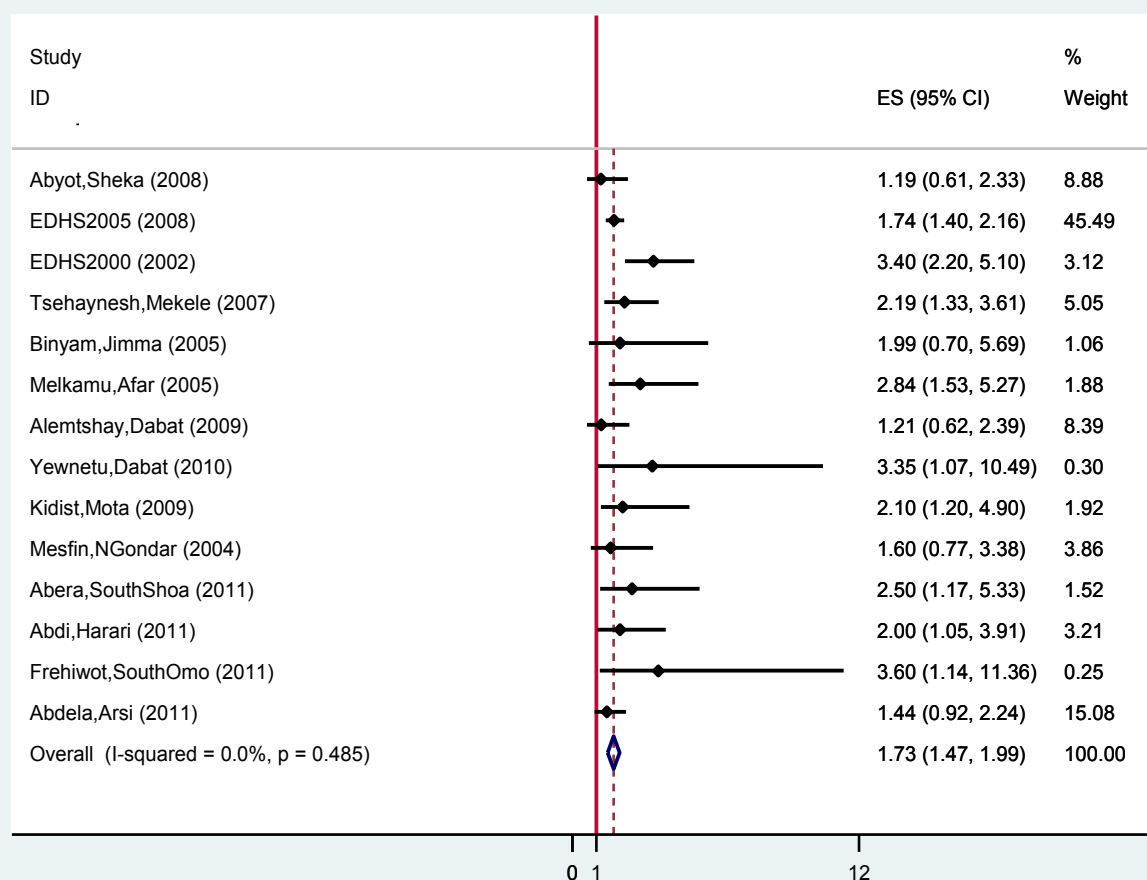


Figure 1: Forest plot showing individual and pooled OR of studies on the strength of association between primary education and delivery services

Residence

Studies indicated that residing in urban areas significantly increases skilled maternal care utilization. A study done in Butajira Rural Health Program site, Gurage Zone, found that urban and rural residents living within a walking distance of less than an hour from health facilities accounted for a significant proportion of all ANC and delivery service users. Living in urban areas was significantly associated with using ANC services (50).

The trends in the 11years between the 2000 and 2011 EDHS surveys indicated that regular antenatal check-ups with trained health providers and delivery at health facility (under the supervision of health professionals) showed a huge disparity by urban-rural gradient. Only 1 in 25 live births among women in rural areas were delivered in a health facility compared with half of the live births among women in urban areas (51). Similarly, postnatal care by skilled providers showed a significant variation by residence. For instance, in the 2000 EDHS, urban women were four times more likely to use PNC services than their rural counterparts (52). The significant

differences in the utilization of maternal health services between urban and rural residents can be explained by the simultaneous occurrences of different reasons. Urban residents have better education coverage, access, and media exposure to get maternal health related information (36).

Age and parity of women

In sub-Saharan Africa, teenagers are generally more likely to receive inadequate antenatal care and have non-professional deliveries (53). A study in three regions (Amhara, Oromia, and Addis Ababa) showed that use of professionally assisted ANC among teenage women aged 15-19 years was very low due to several reasons (54). Older age and multiparity, which are interrelated, showed similar patterns of effects on maternal service utilization in many studies. The proportion of receiving maternal care tends to decline as age at birth increases (47). The DHS study indicated that delivery in a health facility is more common among younger mothers (age less than 35) and mothers with first order births (55). This finding is also supported by a study in Sheka Zone where women with birth order of above four were less likely to give birth at a health facility than those with first order births (46).

In most countries, the proportion of receiving postpartum care tends to decline as age at birth increases (56). Older age and multiparity, which are interrelated, showed similar patterns of effects on maternal service utilization in many studies. Reduced antenatal, delivery and postnatal care utilization are observed in both older age and multiparous women (56-58). But a study done in Botswana indicated that low parity women were less likely to use maternal services (59).

Awareness and experiences of skilled maternal care

Women may get knowledge on the importance of skilled maternal care in ways such as previous exposure to skilled maternal services, community based health education, community media, or due to their better educational status. Previous exposure to skilled maternal services can have a positive or a negative effect in the health seeking behavior of mothers for their subsequent services needs. Different studies showed that maternal services, during previous births have positive effects on current maternal care. For example, a study in India showed that 51.7% of the women with antenatal care preferred institutional delivery as compared to 27.6% of those who had not used antenatal care services (58). Similar findings were observed in studies of other countries (60-62).

In Ethiopia, higher rates of household visits and awareness created by health extension and community health workers were associated with improved antenatal care use and postnatal care visits, but the strategies were not associated with deliveries attended by health professionals (63). Another study conducted in Chilga, northwest Ethiopia, showed that previous attendance has a limited role in subsequent acceptance or use of institutional delivery. In the study, most mothers who had previously attended for institutional delivery, subsequently gave birth at home (64). This could be so because of the unappealing obstetric care given earlier at the health facility. Overall, previous exposure to skilled maternal services can have a significant contribution on the consequent service utilization if service users are satisfied by the care they received; otherwise, bad experience will affect service utilization negatively.

Women's decision-making power (autonomy) and men's involvement

Autonomy is the ability to obtain information and make decisions about one's own concerns. Women's autonomy is women's decision-making ability within their household and their mobility outside of home that depends on the gender norms in the society. Many studies indicated that the gender norms for most ethnic groups in Ethiopia operate along patriarchal lines and cultural 'norms' are often filtered through a male lens. There is male dominance and patriarchic power system that is based on the supremacy of the masculine over the feminine (65).

The health care decision-making capacity of women plays a paramount role in determining their health seeking behavior, which can be evaluated based on their participation in their household decisions. The report in the 2005 DHS reveals that 42% of the decisions on large household purchases are made by the husband or partner alone, and 45% jointly by the wife and partner. More than two-thirds of women (68%) say that decisions to visit the family or relatives are made jointly but 21% by husbands alone (55).

The relationship between women's autonomy and maternal health-care seeking behavior was analyzed by many studies. According to Gebremariam's study, which was based on the analysis of DHS data of Ethiopia and Eritrea, three of the autonomy indices except decision on purchasing daily items showed a significant association with ANC use in Ethiopia. However, only disagreement on unjustified wife beating was associated with delivery service use (66). Another study conducted using DHS data, categorizes women's autonomy as low, medium, and

high. After controlling the effect of other variables, household autonomy has shown a statistically significant positive effect on the utilization of antenatal care services when compared with low and medium household autonomy. Significant effect was not observed in delivery and postnatal care (36). The insignificant association in using delivery service was also observed in studies in North Gondar (45, 48). Though it is difficult to produce a pooled estimate due to the variations in the definitions (categorizations) of autonomy among studies, the reviewed papers indicate the importance of women's autonomy which many women lack in Ethiopia.

Since men decide and control resources, their awareness and involvement have significant contribution in all types of maternal service utilization. Even though it is dependent on the perceptions and beliefs related to pregnancy and childbirth, studies indicate that advice and care by husbands and other family members during pregnancy as well as their involvement in the process of childbirth have positive outcomes. A study done in southwest Ethiopia showed that a husband's approval on ANC had a greater effect on its utilization whether the wife wanted the pregnancy or whatever her level of education. The husband's approval of ANC was stronger when the pregnancy was wanted. It was also found that the impact of a husband's approval of prenatal care was greatest among women under the age of 20 (67). Husbands' involvement is very important especially at the time of pregnancy and childbirth complications. A qualitative data gathered from communities distributed across Ethiopia's 11 regions showed that husbands are important during complications (68). However, there is no evidence about what kind of intervention, targeting male involvement, is relevant to improve the use of maternal health services.

Household wealth

In this literature review, household wealth is identified as one of the strong predictors of the utilization of all types of skilled maternal health services. The paying capacity of mothers for maternal service-related costs is one of the important barriers to service utilization (69). An analysis of antenatal care in developing countries indicates a significant influence of wealth (60). In another study, household wellbeing factors, such as asset possession and the presence of electricity were identified as strong predictors of the use of formal antenatal and delivery care, both in terms of the type of delivery attendant and place (70, 71).

Its positive association with receiving postpartum care is also observed (56). Many more studies reach a similar conclusion about the influence of household wealth on the utilization of skilled maternal care ((72-75). In Ethiopia, women in the highest wealth quintile have a 25.4% skilled birth attendance (SBA) coverage, which is much higher than the national average of 5.6% (76).

Facility level factors

Access to and availability of maternal care services

In order to achieve the goals of skilled maternal care i.e. service utilization and then the survival of mothers, health facilities should be available and accessible. The availability of basic emergency/essential obstetric services at lower levels and a reliable transportation system to link the facilities with comprehensive emergency/essential obstetric services is imperative (77). Recently Ethiopia has introduced a three-tier health care delivery system.

- Level one (primary health care unit) is a Woreda/District health system comprising: a primary hospital for 60,000-100,000 people; health centers and their satellite health posts, serving 1/15,000-25,000 and 1/3,000-5,000 people, respectively.
- Level two is a General Hospital covering a population of 1-1.5 million people.
- Level three is a Specialized Hospital covering a population of 3.5-5 million people (12).

Basic and comprehensive emergency/essential obstetrics services are expected to be provided at health centers and hospitals, respectively. Obstetric care facilities must exist and be distributed in a useful fashion to be used by women who really need them. It is recommended that for every 500,000 people, there should be at least four basic and at least one comprehensive EOC facility (1, 77).

The proximity of maternal health services to users is critical for increasing utilization and thus preventing maternal mortality and morbidity. Unfortunately, in many countries skilled professionals and facilities are clustered in urban centres. An analysis of geographic distance to available services indicated that longer travel times or farther distance to services was independently associated with lower utilization of all types of maternal health services. Evidences from Paraguay, Uganda, Tanzania, Mali and South Africa support the strong association of distance with maternal service utilization (70, 73, 78, 79). Similar findings are observed in Ethiopia (80).

The concept of continuum of care is very important for maternal and neonatal survival. The continuum starts with the woman and her family in the woman's own home (self-care and prevention). For low risk women, maternity care led by midwives rather than physicians is appropriate at primary health care facilities (81). When complications occur, women and/or their newborns need care at secondary or tertiary levels of the health system, depending on the seriousness of their respective conditions. Access to emergency obstetric care is more important for maternal and neonatal survival in developing countries with very low skilled maternity care. Findings of such studies showed that both maternal mortality and stillbirth rates decreased sharply as the cesarean section rates increased (82, 83). Its effect in reducing intra-partum related neonatal deaths was also observed in other studies (84). However, the successful provision of the continuum of care depends on the presence of a functioning referral system.

The presence of a functioning referral system requires the availability of all weather roads, ambulances and financing means to have the shortest travel time. Travelling time is crucial to the survival of women with complications. The estimated average interval from onset to death for major obstetric complications, in the absence of medical intervention, is two hours by post-partum haemorrhage, 12 hours by antepartum haemorrhage, one day by ruptured uterus, two days by eclampsia, three days by obstructed labour, and six days by infection (sepsis). According to these estimates, post-partum haemorrhage can kill a woman in a very short time. It is the major cause of maternal death in sub-Saharan Africa (85) and even in developed countries (86). Haemorrhage is, however, one of the few major obstetric complications for which first aid could be provided at peripheral health facilities. It might be possible to establish a reasonable standard to make services available. For example, basic and comprehensive EOC can be made available within 3 and 12 hours' of travel, respectively, for most women. In Ethiopia, most of the basic emergency obstetric care facilities have no ambulances for emergencies (68).

Quality of care in the facilities

The question of performance (quality) is one of the critical issues in maternal care. Once the mother arrives at the health facility, she has to have access to a medical professional who has the skills and equipment necessary to give the necessary services. After all, many women die in hospitals. Some of them die because they are not admitted until their condition is critical.

Many others, however, die because they do not receive timely treatment or because the treatment they receive is inadequate. Different studies show that many facilities suffer from staff training deficiencies, shortages of key staff, equipment/drug shortages, or poor management. For instance, in Paraguay, getting facility-based deliveries is negatively related to drug stock out (70).

Understanding on how facilities actually function is more useful rather than how they are supposed to function. A functioning obstetric facility means a facility providing essential services for normal situations and performing each signal functions for complications 24 hours a day and 7 days a week. A study on health facilities in 13 countries found out that most hospitals do not provide life saving services fully. For example, assisted vaginal delivery is missing in 42%, 73%, 38%, and 19% of the hospitals in Benin, Mali, Morocco, and Uganda, respectively. The removal of retained products is missing in 12%, 9% and 12 % of the hospitals in Benin, Mali and Morocco, respectively (87). Similar studies reveal the fact that facilities are not performing what they are supposed to perform (79). Studies indicated that improving the quality and access of emergency obstetric facilities increases maternal service utilization (88).

Competence of care providers

One of the dimensions of quality of care is the competence of care providers. All skilled providers are expected to perform basic life saving procedures safely and competently. Moreover, good caring attitudes and behaviors towards maternity clients is required to respond to the needs of clients promptly, to provide reassurance and offer information during labor and birth. A study done to evaluate the skilled birth attendance competence of health professionals who typically attend hospital and clinic-based births in Benin, Ecuador, Jamaica, and Rwanda showed a wide gap between current evidence-based standards and levels of provider competence. In the study, providers answered 55.8% of the knowledge questions and performed 48.2% of the skills steps correctly (5).

In view of the shortage of physicians in most settings of developing countries, it is imperative to have adequate trainings and updates for non-physician providers available and accessible to all women. Clients seen by providers who had received training were more likely than those seen by untrained providers to be educated and counseled about some preventive and health-care-seeking

practices during pregnancy, at birth, and after delivery (89). WHO recommends that maternity care providers need to receive refresher training or updates in midwifery every three to five years. In many developing countries, women have strong views about their preferences for more qualified providers (specialist doctors) (90).

Community level factors

Several community level factors affect maternal service utilization. Low level of education, geographical isolation, and a high poverty rate in the community reduce access to skilled maternal services (61). Evidences also show that urban residence and the presence of community media significantly increase maternal service utilization (56, 72).

The availability and access to community-based financing or a health insurance system is also a very important factor at the community level. A study in three west African countries, Senegal, Mali, and Ghana showed that membership in a community-based insurance scheme was positively associated with the use of maternal health services, particularly in areas where utilization rates were very low especially for more expensive delivery-related care (91). This is also true in a Vietnamese study, particularly on middle and high-income women (61).

Traditional or cultural factors found in communities are important barriers to maternal service utilization in many countries, including Ethiopia. Communities have different cultural perceptions on the causes, symptoms, and management (treatment) of illness, which quite often have impacts on the maternal health service seeking behavior pattern and outcome. Many people in Ethiopia associate illnesses with a person's sins or the anger of spirits. Due to these perceptions, traditional healers and religious leaders have roles to play in the care of mothers during childbirth and complications. So, seeking care for complications start after the failures of local or herbal remedies and prayers (68).

In Ethiopia, usually pregnancy is not discussed until it is noticeable (92). Evidences from Afar indicate that husbands hesitate to send their wives to health institutions alone and to let them be examined by male midwives mainly on religious grounds (39, 93).

If a woman is in labor, she might notify her mother or a female friend, but not her husband. Men aren't involved in the delivery process (92).

In the postpartum period, the mother rests in the house for 40 days where she is usually separated from her husband and remains sexually inactive (46). In this period, especially in the first 10 days postpartum, mothers are watched carefully to protect them from malevolent spirits (94). This culture makes postnatal care seeking difficult.

At times of complications, the first response is praying according to the beliefs in the community, and subsequently, if no improvement, applying local/herbal solutions to the complication, and, as a last resort, referring to a health facility (68). The delays due to traditional trials for complications may end with the loss of the mother. The Ethiopian culture restrains most emotional outbursts except at the death of loved ones. In the event of death tremendous mourning takes place (95).

State/national level factors

Among variables applied at the national level, government health expenditure is a strong predictor for skilled maternal health care utilization. A study in developing countries indicates that government health expenditure, as a percentage of the total health expenditure, is significantly associated with the utilization of skilled birth attendants and the caesarean section (96). In Ethiopia, expenditure on health indicates an increasing trend. The 2007 annual performance report of Federal Ministry of Health showed that the percentage share of the health budget to the total budget reached 11.56% in 2006. The per capita public expenditure in absolute terms was 21.6 Ethiopian Birr (97).

The presence of an appropriate national health policy to respond to the current major challenges, cost, quality, and equity is another national level factor affecting maternal service utilization. Introducing a health sector reform by improving the areas of finance, organizational structure, public-private partnerships, service delivery, health policies/laws and others is useful for all types of reproductive health services ((98). A comparative analysis conducted based on extensive case studies of maternal health and health systems in four countries (Bangladesh, Russia, South Africa, and Uganda) showed that the most common health system characteristics affecting maternal health were human resource structures, the public-private mix of service provision, and the changes involved in health sector reforms (99).

1.4. Conceptual Framework

In order to assist the evaluation of the determinant factors of skilled maternal care utilization and the effect of skilled care, a conceptual framework was constructed based on the literature (Figure 2). The framework broadly explains the determinants of skilled maternal care utilization by classifying them in to three interrelated levels. It also presents the two major pathways of maternal health and survival, skilled maternal health services and other factors (general health & nutritional status before and after pregnancy).

Individual and household level factors involve, the socio-demographic characteristics of women (age, parity, education, occupation, family size etc), maternal service related knowledge, perception and experience, household wealth status, women's decision-making power and the involvement of husbands and other family members.

Facility and community level factors include facility related factors (like access to and availability of maternal services and quality of care in the facilities) and provider related factors (competence and caring attitudes and behaviors). Moreover, community related factors like the availability & access to community infrastructure & resources, community based financing , and community traditions related to care of pregnancy and childbirth (preference to home birth and TBAs, perceptions and beliefs related to cause, and treatment of illness) are included under this level.

State/national level factors related to government policies like government health expenditure and national health policy are shown in the framework. In addition to the characteristics of second (communal) and third (state) levels, aggregated figures of individual measurements can be considered during the analysis.

The utilization of skilled maternal health services is directly linked to maternal health and survival through its contribution to reducing adverse pregnancy outcomes. However, it will be meaningful when a woman receives the full components of maternal services in both normal conditions and at the time of complications.

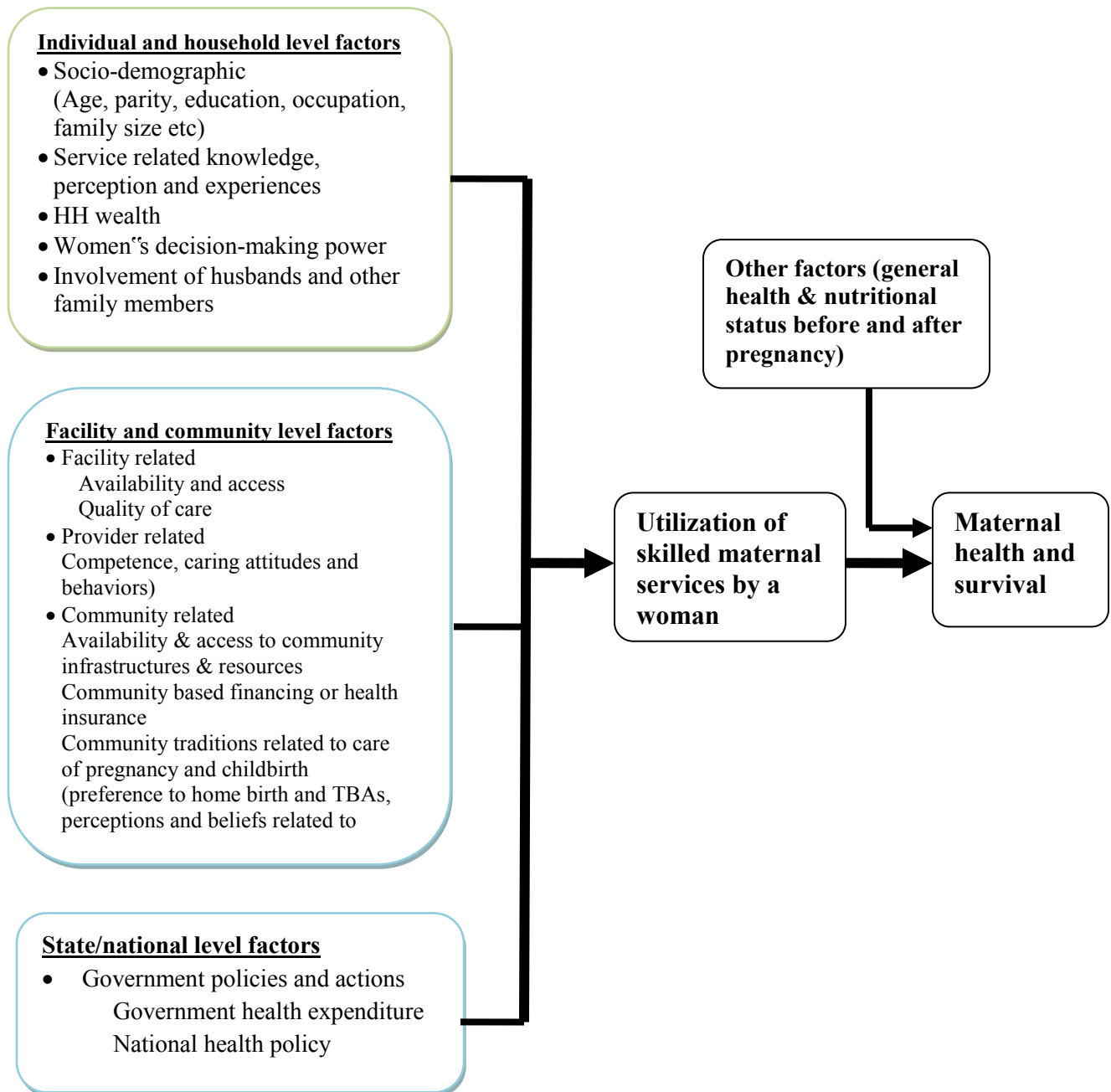


Figure 2: Conceptual framework to review the pathway of determinant factors affecting utilization of skilled maternal care and maternal survival

II. Research Questions and Objectives

Major research question

Why is skilled maternal care utilization very low in Ethiopia?

Specific research questions

1. What is the level of women's awareness, perception and utilization rates of skilled maternal care?
2. Are health facilities ready and offering essential skilled maternal services?
3. What are the factors associated with skilled maternal care utilization and how they operate at different levels in the Ethiopian context?
4. What is the contribution of using the available skilled maternal care (with its current quality) in the study area? Are beneficial services (essential maternal services) obtained?

Objectives

General

To describe skilled maternal care utilization and to identify associated factors operating at different levels

Specific objectives

1. To assess the level of skilled maternal care utilization for normal and complicated conditions during pregnancy, delivery and postpartum period (Paper I and II)
2. To measure the availability and performance of facilities to provide skilled maternal care in the area (Paper III)
3. To identify the determinants of skilled maternal care (ANC, Delivery and PNC) utilization at different levels (Paper IV)
4. To investigate the immediate effects of using the available skilled maternal care on the health of mothers and their babies (reducing adverse pregnancy outcomes) (Paper V)

III. Methods

3.1. Study Area and Setting

North Gondar Zone was the study area. Both institution and community-based studies were conducted. Linked facility and population-based surveys were carried out at zonal level in six selected districts. The cohort study was restricted to Dabat district, in 10 kebeles (7 rural and 3 urban).

Background of the study area

Ethiopia is a land-locked country located in East Africa, and bordered by Eritrea, Djibouti, Somalia, Kenya, South Sudan and Sudan. With an estimated population of more than 85,000,000, it is Africa's second most populous country (100). It encompasses about 1.1 million km² area of land and is characterized by diverse climate and topography with a marked difference in the climate conditions (101). The male to female ratio is 1.02 and 84% of the population dwells in rural areas. Oromo and Amhara are the major ethnic groups constituting about 61% of the population. The commonest religion is Orthodox Christianity, followed by Muslim and Protestant (102). The national economy is dependent on subsistent agriculture which accounts for 45% of Gross Domestic Product (GDP) (103). For the most part, the environment determines local livelihoods and resources: inhabitants of the fertile central highlands practice small-scale agriculture and animal husbandry, while nomadic pastoralists live in the dry eastern and southern lowlands. Because of deforestation and land degradation by the high population pressure, food insecurity was prevalent across many rural areas of Ethiopia, with negative consequences for the nutrition and health of mothers and their infants.

Amhara, one of the nine regional states of Ethiopia, is located in the northwestern part of the country. According to figures from the Central Statistical Agency, 2007, the region had an estimated population of 17,214,056, of whom 8,636,875 were male and 8,577,181 were female (102). According to EDHS 2011, the coverage of antenatal, delivery postnatal care by skilled providers were 33.6%, 10.1% and 5.1%, respectively (11).

North Gondar (Amharic name: "Semien Gondar") is one of the 11 zones of the Amhara Region located 740 kilometers northwest of Addis Ababa. North Gondar, which is the largest zone of the

region, has a difficult topography. This Zone is named after the city, Gondar, the capital of Ethiopia until the mid-19th century, which has often been used as the name of the 20th century province of Begemder and Semien. The zone is known for its tourist attraction sites such as the Semien Mountain National Park and the seventeenth century castle of Emperor Fasil. It has 22 districts (woredas). At the time of the study, there were over three million inhabitants in the zone, about 84.1% of which were rural dwellers. Amhara is the largest (90%) ethnic group and Amharic is the dominant (98.24%) language in the zone. About 95.32% of the people are Ethiopian Orthodox Christians, and 4.54% Muslims (104). Around 62% of the zone is exposed to malaria (105). In the zone, there is only one referral hospital with a comprehensive emergency obstetric care and about a hundred health centers and two rural hospitals.

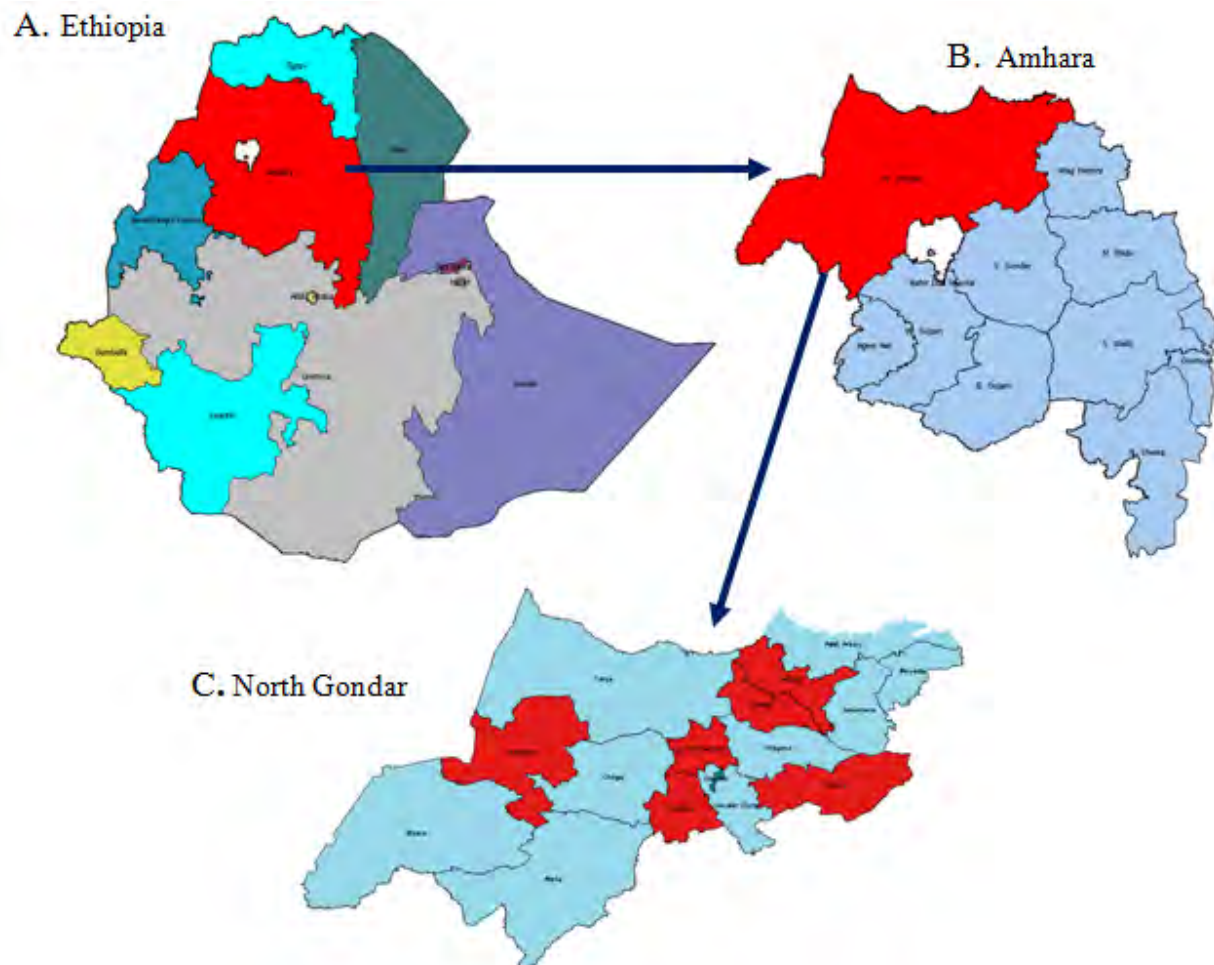


Figure 3: (A) Map of Ethiopia showing regional states and city administrations, (B) Map of the Amhara region showing zones, and (C) Map of North Gondar zone showing woredas. The red colored maps indicate the study areas.

Dabat, selected for the cohort study, is one of the 22 districts in North Gondar zone, and is located 75 km to the north of Gondar town. According to the 2007 census report, the district had an estimated total population of 145,458 living in thirty kebeles (lowest administrative units). Of these, 15,818 (11%) and 129,640 (89%) were urban and rural inhabitants, respectively (102). The district had 29 functioning health institutions (27 health posts and 2 health centers) during the study period. There were no private institutions. The health centers are expected to provide basic essential/emergency obstetric care while the health posts are organized to focus on preventive and promotive health services. The district is the research center of the University of Gondar for Health and Demographic Surveillance System (HDSS), which comprised seven rural and three urban kebeles. After the stratification of the district into climatic subzones, the research team randomly selected seven kebeles from highland (cold), one kebele from mid land (temperate) and two kebeles from low land (hot) (106). Seventeen experienced data collectors and three onsite supervisors were employed for the ten sites (kebeles).



Figure 4: Map of Dabat district with study sites (the rose-colored kebeles).

3.2. Study Design

The study applied quantitative and qualitative studies with descriptive and analytic elements. It used a linked facility and community-based survey, and cohort designs to address its specific objectives.

To assess the level of utilization rates and experiences of women, a community-based cross-sectional study (community-based survey) was applied. To measure the availability of services and the performance of facilities, facility-based cross-sectional study (facility-based survey) was conducted. In order to identify the determinants of skilled maternal care utilization, both the facility and community-based survey data were linked and skilled maternal service users (cases) and non-users (controls) were compared. To assess the effects of skilled maternal care, a cohort study design was employed. In the later case, pregnant women were classified based on their service utilization status and followed until 42 days of their postpartum period to see occurrence of the outcome of interest (adverse pregnancy outcomes).

For the qualitative part, a phenomenological study (in-depth interview) was employed as a supplement for the quantitative findings. It was used to describe and interpret the experiences of participants in order to understand their perspectives.

Timeframe of the Study

The linked facility and population-based surveys were conducted from January 1 to March 31 2012 and the cohort study from December 1, 2011 to August 31, 2012.

3.3. Study Population and Sampling

Study population

For community-based survey: Women who had births within the past one-year preceding the survey were included in the sample. Women of reproductive age who had births (normal & complicated) and their husbands, traditional birth attendants, elders and community leaders participated for the qualitative study.

For the facility-based survey: In order to have linked data, the health centers near the selected clusters (kebeles) and hospitals in the zone were selected. Facility technical staff managers and maternal health care providers were included for interview.

For the follow up study: All pregnant women in the selected kebeles identified during the study period were included.

Sample size

The sample size addressed both the descriptive and analytic objectives of the study. Since the study designs supplemented each other, the sample size was determined after calculating the required sample for analytic studies and checking whether the size was adequate for the separate analysis of the facility and the community based data.

To compute the optimal sample size for the population-based survey, the following single population proportion formula was applied. The computation was made with the inputs of 95% confidence level ($Z_{\alpha/2}=1.96$) and the margin of error (d) with different sizes (depending on the rareness). The expected prevalence (P) was taken from different studies (73, 101, 107). Since the study involved the multi-stage sampling technique, a design effect (DE) of three was considered in the sample size calculation.

$$n = \frac{Z_{\alpha/2}^2 P(1-P)}{d^2} \times DE$$

Six sample sizes were calculated based on a variety of indicators:

1. Perception about the importance of maternal health care (80% at marginal error of 4)
2. Knowledge on danger signs (23.8 % at marginal error of 4)
3. Knowledge on preparation for birth and its complication (40% at marginal error of 5)
4. ANC by health professional (27.6% at marginal error of 4)
5. Delivery care by health professional (5.7% at marginal error of 2)
6. PNC by health professional (5.5% at marginal error of 2)

Of the calculated values, the largest sample was 1550 women based on the 5th indicator, delivery by health professional. During the survey, 1730 women were identified for interview from the 12

clusters (kebeles), which were sufficient to satisfy the sample sizes to estimate skilled service utilization in both normal and complication conditions.

For the facility based survey, basic essential obstetric care facilities (health centers) utilized by the selected kebele population were identified in order to have a linked data. Twelve health centers (basic essential obstetric care facilities, one for each kebele) and three hospitals were included. All skilled providers assigned for maternal services were interviewed.

To identify the determinants of skilled maternal care utilization, the following double population proportion formula was utilized. In the formula, $Z_{\alpha/2}$ corresponded to the confidence level; Z_{β} corresponded to the power of the study; r is the ratio between “skilled maternal care non-users” and “skilled maternal care users”; P_1 and P_2 are the expected prevalence of the exposures in “non users” and “users” and P is the weighted pooled proportion for P_1 and P_2 . P_2 was calculated based on P_1 and the Odds Ratio (OR) for the association between the exposures and outcomes of interest.

$$n = \frac{(Z_{\frac{\alpha}{2}} \sqrt{(1 + \frac{1}{r})P(1-P)} + Z_{\beta} \sqrt{P_1(1-P_1) + \frac{P_2(1-P_2)}{r}})^2}{(P_1 - P_2)^2}$$

The computation was made via StatCalc application of EPI-Info Version 3.5.3 with the inputs of 95% confidence level, 80% power and one to three ratio between skilled maternal care users and non-users. The expected prevalence of the exposures in the non-user group and the OR for the association between the exposures and outcomes were taken from previous studies conducted in the country. Accordingly, 12 sample sizes were calculated based on the differences in frequency of important individual and HH level exposure variables including birth order, residence, education, and wealth quintile on the use of ANC, delivery and PNC services in the 2005 EDHS findings (101). The maximum sample sizes, **127** cases and **381** controls were obtained to detect the OR of 1.8 in ANC utilization by birth orders. However, the sample size calculated for the population-based survey was judged a sufficient source for identifying the determinants of skilled maternal care utilization.

The adequacy of the sample size for investigating the effects of skilled maternal care (cohort study) was also assessed using the aforementioned double proportion formula. Sample size was

calculated by assuming a 95% confidence level, 80% power and a 1:2 ratio of skilled maternal care users (exposed), and non-users (non-exposed). Furthermore, a relative risk of two, 15% non-user have probability of at least one complication or death (1) and a possible follow up loss of 5% were considered for the calculation. StatCalc application of Epi Info version 3.5.3 was used for the calculation. Ultimately, the sample sizes were about **247** users and **493** non-users.

Sampling technique and procedures

Sampling design and population for the linked facility and population-based survey

A multistage sampling technique was applied to select the study population. Initially, six districts of the zone, namely Dembia, Lay Armachiho, West Belessa, Metema, Debark and Dabat were selected. Then a total of twelve clusters or kebeles (two kebeles per district) were selected randomly. All eligible women (women who have births within the past one year preceding the survey) found in the selected cluster were studied using house-to-house surveys. Accordingly, 1730 women were identified for interview.

For the qualitative part, participants for the in-depth interview were identified through purposive sampling. Different categories of participants from all districts were selected in order to triangulate the findings by data source and site. Thus, 12 women (maternal service users and non-users) together with their husbands, 12 elders (6 male and 6 female) and 12 TBAs were included.

In order to have a linked data, the best approach was linking the sample areas i.e. facility-based survey linked to population-based survey sample areas (108). Hence, the population-based survey clusters were bases to identify such facilities. Accordingly, basic essential obstetric care facilities (health centers) and hospitals utilized by the kebele population were selected for the facility-based survey. Skilled providers assigned for antenatal, delivery, and postnatal services in each facility were selected for interview. Additionally, service users identified in the population-based survey were asked about their use of maternal service in facilities.

Sampling design and population for analysis of determinants

During the baseline survey, important information for skilled maternal care was collected from all eligible mothers. All mothers who had and did not have skilled maternal care were selected

from the baseline survey and categorized as users (cases) and non-users (controls) according to the service they used (ANC, Delivery, PNC and at the time of complications). For the multilevel analysis of determinants of ANC, Delivery and PNC services, community and facility level characteristics were linked.

Sampling design and population for the follow up study

All pregnant women, who were permanent residents of the DHSS sites (kebeles), were identified by a baseline survey and joined the follow up scheme. Then, new pregnant women were added through monthly detections until the sample size was adequate for the analysis.

3.4. Data Collection Tools and Procedures

Tools and procedures for the linked facility and population-based survey

The population-based survey questionnaire was adapted from DHS and other maternal and child health surveys in accordance with the conceptual framework of the study. The tool was developed in English and later translated and finalized in Amharic. The questionnaire included a range of closed and open-ended questions on socio-demographic characteristics, awareness, perceptions and experiences related to maternal services during antenatal, delivery, postpartum and complications. Most of the questions were validated and utilized in Ethiopia. Questions on maternal service experiences related to the type of service provider and facility, estimated time and distance to reach facility, waiting time at health facility, the major type of care provided at a health facility, and the cost expenditure for transport and care. Data collectors and supervisors were at least diploma and degree graduates, respectively, from recognized institutions. Accordingly, 36 data collectors and supervisors (two data collectors and one supervisor for each kebele) were trained and deployed for the population-based survey. The interviews were conducted in Amharic after questions were pretested for cultural appropriateness and clarity.

For the qualitative part, in-depth interview guides were prepared separately for women (uncomplicated and complicated childbirths), men (husbands), elders and traditional birth attendants. The in-depth interview guides consisted of multifaceted open-ended questions covering a range of issues related to experiences, perceptions and barriers related to skilled maternal care during pregnancy, delivery and postpartum period. Three Gondar university staff members with a master's degree were assigned to conduct the in-depth interview using voice

recorders. The interviewers used probing and question-rephrasing techniques to clarify questions and obtain details from the respondents. Interviews were conducted until a saturation point was reached when no new information or insight into the women's health-seeking behaviors and perceptions was obtained. Overall, 36 in-depth interviews were conducted.

During the facility-based survey, the interview with managers (heads of the health institutions) and observations were used to collect data on the number, training and competency of the obstetric staff; services offered; signal functions; physical infrastructure; the availability, adequacy and functional status of supplies and other essential equipment for maternal services. In addition, all skilled care providers (midlevel) who were directly involved in (assigned to) in maternity care at health centers and district hospitals (38 skilled providers) were interviewed about their training and skills in different types of procedures. Fourteen experienced health professionals were recruited to conduct the facility-based survey.

Tools and procedures for the cohort study

Data was collected using a follow up questionnaire, which was prepared to do a progressive evaluation. The questionnaire included four major components: background information at the first contact; and the three evaluation tools corresponding to the three time points, during pregnancy (9th month), within one week after delivery, and on the forty-second day of postpartum. To collect data at home, mothers were interviewed by means of questions and checklists.

During the interviews, the types of providers, types of services they received, the number of antenatal visits, complications, and morbidities were recorded. Seventeen data collectors and three supervisors, employed for the Dabat DHSS, gathered the data. Additionally, there was at least one informant in each village (a farmer living onsite); totally 34 informants were involved for the detection of pregnant women.

At the beginning, all available pregnant women in the DHSS sites (kebeles) were identified through a baseline survey. Then, informants and data collectors detected and included additional cohorts monthly.

Special cases like women with abortion had only first evaluation, and women with stillbirth (pregnancy loss after 28 weeks of gestation) and pregnant women with preterm birth may not have first evaluation but it was conducted together with the 2nd and 3rd evaluation by excluding some questions inapplicable for the time.

Data collectors were trained for five days and used prepared guidelines to assess the exposure status of the expectant mother and to do outcome ascertainment (to level the type of morbidities as complications). Women with illness, identified during home visits were urged to get examination and treatment at the nearby health institution.

3.5. Data Management and Analyses

Data entry, cleaning and management

After the appropriate coding, the data were entered using the Epi Info version 3.5.3 software in a well-prepared data entry template. Two experienced clerks did the data entry. After the entry was completed, the principal investigator (PI) rechecked its correctness. The data were screened for missing, outlier values and data entry errors using the frequency distribution of the variables and observation of the entered data. Actual and suspected errors were validated against the raw data and the necessary corrections were made before the analysis. In all of the variables, actual missing values were very few and random, so they were left unaltered.

Data analysis and modeling

After the screening and correction of the data entry errors, the data were exported to SPSS 16 and STATA version 11 software for analysis. Data description was made using mean, median, Standard Deviation (SD), frequency, percentage and graphs. Estimates of population parameters were presented with a 95% Confidence Interval (CI). In every application of inferential statistics, a *P* value of 0.05 was taken as significance level.

The analyses of the quantitative and qualitative data collected through a population-based survey were utilized to address the first objective. A descriptive analysis of the data collected through the facility and the population-based survey were used to see the availability, readiness and performance of facilities in providing skilled maternal care (to address the second objective). The

third objective, to determine factors affecting mothers in the utilization of the routine skilled maternal care (ANC, delivery and PNC), was addressed using the multilevel binary logistic regression analysis. The linked facility and population-based surveys allowed us to include all potential factors operating at individual, household, community, and health facility levels. The last objective, to investigate the immediate effects of using the available skilled maternal care on the health of mothers and their babies, was addressed based on the data collected through the follow up study. Incidences of adverse pregnancy outcomes (complication and death) among mothers and their newborns were compared among skilled maternal care users and non-users, and the effect of skilled maternal care (ANC and delivery) was evaluated after controlling for potential confounders using logistic regression.

Principal Component Analysis (PCA)

The principal component analysis (PCA) provides a set of linear combinations (weighted sums) of the observed variables that account for the largest proportion of the total variance. During the analysis, important assumptions including Bartlett's Test of Sphericity, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, and communalities scores were checked. It is recommended that the sum of the components (Eigen values greater than 1) should explain 60% of the total variance (109).

The index of wealth status, as a composite indicator of living standard, was computed by the PCA from ten variables (presence of own farmland, own toilet facility, bank account, mobile phone, electricity, corrugated iron sheet roof, number of cows/oxen, horses/ mules/donkeys, goats/sheep and chicken).

Initially, 19 variables were considered for the analysis. However, 9 variables were dropped as their communality scores were less than 50%. Ultimately, four principal components with Eigen values greater than 1 (depicted as points “above the elbow” on a scree plot) were identified for the index construction. The components explained 68.3% of the total variance which was above the recommended minimum value (110). Wealth index values were calculated by summing up the scores for the four components. Finally, the index was developed by categorizing the sum of components in to five equal parts, and the parts were ranked from the poorest to the wealthiest quintile.

Logistic regression analysis

The binary logistic regression modeling was applied in two of the papers to identify factors associated with skilled care seeking at the time of obstetric complications, and to control potential confounders when assessing the relationships between skilled care and adverse pregnancy outcomes.

The “enter” method was used to perform the multivariate analyses. Before the analysis, the major assumptions of logistic regression, like the absence of multicollinearity among the independent variables were checked to be satisfied. For a given covariate multicollinearity is considered to be absent when its Variance Inflation Factor (VIF) is below 10 (111). The fitness of logistic regression models was assessed using the Hosmer-Lemeshow statistic. The binary and multivariate outputs were presented in Crude Odds Ratio (COR) and Adjusted Odds Ratio (AOR), with their respective 95% CI.

Multilevel logistic regression analysis

The rationales for using a multilevel modeling were the following. Firstly, the utilization patterns of maternal health services are influenced by characteristics at different levels (individuals, households, community, and health facilities). Analyzing variables from different levels at one single common level, using the standard binary logistic regression model leads to bias (loss of power or Type I error). The traditional approach also suffers from a problem of analysis at the inappropriate level (atomistic or ecological fallacy). Multilevel models allow us to consider the individual level and the group level in the same analysis, rather than having to choose one or the other. Secondly, due to the multistage cluster sampling procedure, individual women were nested within kebeles; hence, the likelihood of women seeking maternal health services is likely to be correlated to the kebele residents. The assumption of independence among individuals within the same cluster, and the assumption of equal variance across clusters are violated in the case of nested data. Hence, the multilevel analysis is the appropriate method for such cases.

Using a two-level binary logistic regression modelling, we examined the effect of a number of individual, community, and facility variables. During the analysis, the characteristics of women and household were taken as individual level (level-1), and the characteristics of the kebeles (including the characteristics of their health centers) were treated as level-2. For each of the three

dependent variables, we estimated two models: the intercept-only model; an empty model that contains no covariates, and a full model that included individual, kebele, and facility level variables. The full model was a random slopes model for ANC and a random intercept model for delivery and postnatal care. The intercept-only model allows us to evaluate the extent of the cluster variation influencing maternal service utilization of women. Based on this model, the intra-class correlation coefficient (Rho) was calculated to evaluate whether the variation in the scores was primarily within or between clusters.

Thematic content analysis

A thematic content approach focusing on the study questions was applied to analyze the qualitative data. Initially, all tape-recorded notes were transcribed into English text format. Subsequently, it was analyzed using the thematic content analysis technique. Using the open code software, conceptual codes that evolved from the text were applied throughout the texts. Finally, emerging themes and categories were identified. Ultimately, the quantitative and qualitative data were triangulated at conclusion to improve the validity as well as to complement the quantitative findings.

3.6. Quality Assurance Mechanisms

Various actions were taken to maintain the quality of the research starting from designing the tool to data analysis and interpretations.

The questionnaires were adapted from standard data collection instruments used by the DHS and other maternal and child health surveys. Simple and easily understandable languages were used for the preparation and translation to the local language, Amharic. Appropriate customization and modifications were made after the instruments were pretested for cultural appropriateness and clarity.

Data collectors and supervisors were recruited by considering important criteria, like level of education and experience. For instance, a minimum of diploma and degree were required for selecting data collectors and supervisors for the population-based survey, and master's level staffs were used to collect the qualitative data. Similarly, experienced health professionals did the facility-based survey, and experienced data collectors and supervisors who were working at the Dabat DHSS were involved in collecting the follow up data.

Before the commencement of data collections intensive trainings, including orientation, idea exchange, and demonstrations were offered for data collectors and supervisors. Trainings were provided until the trainees used the prepared guidelines and questionnaire without any difficulty.

The data collection procedures were closely supervised. All questions were checked for completeness and immediate actions were taken. In most cases, proper feedbacks were given to data collectors, and in some kebeles data collection was repeated.

To minimize errors during data entry, the templates were programmed using check codes. Data entry clerks also had adequate experience to use the software. After the entry was completed, the PI was rechecked for correctness against the raw data, and necessary corrections were made before the analysis.

Advanced techniques & appropriate modeling were applied during the analysis. Important assumptions and fitness of such statistical models were checked using the standard procedures.

During the interpretation of the quantitative findings, detailed views of the meaning of the phenomenon or concept for individuals were considered. In this way, the data collected through different methods were triangulated at the time of conclusions.

3.7. Ethical Considerations

This study was conducted with confirmation of national and international ethical guidelines for biomedical research involving human subjects (112). Before the commencement of the study, ethical clearance was obtained from the Institutional Review Board of the College of Health Sciences, Addis Ababa University (AAU). Then permission letters from officials of districts and health institutions were processed before starting data collection. During data collection, the study participants were asked for consent and signed written agreements on consent forms. The consent was secured after the purposes of the study, the rights of participants, potential benefits and harms of the study, etc were thoroughly and privately communicated. They were informed to interrupt the interview on desire. To ensure confidentiality, names were not used; instead, code numbers were assigned to depict the results, and the questionnaires were kept locked.

The study did not involve any undue financial or non-financial inducement. The study subjects were not persuaded or influenced in any way to take part in the study.

A great effort was made to maximize the beneficence aspect of the study. At the end of each interview, women received maternal and child health related advise. Women or other family members found sick were urged to seek care in the nearby health center. For some critically sick women, some portion of the transportation cost was covered. In order to maximize the benefit of the study to the community, district officials were informed on selected service problems provided by their facilities so that they may start suitable interventions.

3.8. Tabular Summary of the Methods Applied in the Dissertation

Table 1: Summary of methods based on objectives of the study

No	Objectives/Research question	Study design	Study subjects	Sample size utilized	Data collection	Data analyses
1	To assess the level of skilled maternal care utilizations for normal and complicated conditions during pregnancy, delivery and postpartum period	Population-based cross-sectional	Women who gave birth one year preceding the survey	1668 women	Structured questionnaire interview(survey) In-depth interview	Descriptive analysis (text, tables and graphs) Logistic regression during analysis of skilled care for complications
2	To measure availability and performance of facilities to provide skilled maternal care in the area	Linked facility and population based survey	All facilities utilized by the cluster population And all skilled providers assigned for maternal health care Skilled care users	12 health centers and 3 hospitals 38 maternal health care providers and 769 service users (538 ANC and 231 delivery)	Structured questionnaire interview and observation	Descriptive analysis (tables and graphs)
3	To determine factors affecting mothers in utilization of the routine skilled maternal care (ANC, Delivery and PNC)	Case –control by using the linked facility and population-based survey as baseline	Women who gave birth one year preceding the survey	From 1668 women, 538 ANC users, 231 delivery care users and 105 PNC users selected as cases and the remaining act as controls	Information about potential correlates collected using a structured questionnaire	Multilevel logistic regression analyses
4	To investigate the immediate effects of using the available skilled maternal care on the health of mothers and their babies	Follow up study	Pregnant women	763 pregnant women Exposure: 265 and 134 of them were ANC and delivery care users Outcome: 153 had adverse pregnancy outcomes (complication or death)	Structured questionnaire interview and observation	Descriptive analysis (tables and graphs) Logistic regression during analysis of the effects of skilled maternal care

IV. Results (Review of Main Findings in Manuscripts I–V)

In this section, main findings from the five manuscripts are outlined and reviewed.

Table 2: Summary of main findings from the five manuscripts

MS	Objective	Main findings
I & II	Assess level of skilled maternal care utilization for normal and complicated conditions during pregnancy, delivery and postpartum period	- All indicators of skilled maternal care service utilization were very low in the study area – only 32.3%, 13.8% and 6.3% received the routine antenatal, delivery and postnatal care from a skilled provider. - Most women do not seek the routine maternal services if they have no morbidity mainly due to low perceived risk of pregnancy, cultural barriers, and perceived poor quality of services at the health facilities. - About 28.5% women reported some kind of complication throughout pregnancy, delivery and postpartum periods. However, nearly half (48%) of them did not seek care from skilled providers. - Inability to judge the severity of morbidities, distance/transport problems, lack of money/cost considerations and use of traditional options at home were the major reasons for not seeking skilled care during complications. - Belonging to a wealthier quintile, getting antenatal care from a skilled provider and readiness of a woman for possible complications was significantly associated with seeking skilled care during complication.
III	Measure the availability and performance of facilities to provide skilled maternal care in the area	- Antenatal and delivery care were available in most of the visited facilities. However, important components of both the routine and emergency maternity services were incomplete. - Signal functions including administration of anticonvulsants and assisted vaginal delivery were missing in seven and five of the 12 health centers, respectively. Only one hospital met the criteria for comprehensive emergency obstetric care (perform cesarean section). - Only 24% of the providers used partograph consistently. - At the time of antenatal care, women received important components of services like blood pressure checkup (79%), urine testing (35%), tetanus immunization (45%), iron supplementation (64%), birth preparedness counseling (51%) and HIV testing (71%). - During delivery, 80% had their blood pressure measured, 78% informed on labor progress, 89% had auscultation of fetal heartbeat, 80% took drugs to prevent bleeding and 78% had counseling on early & exclusive breast-feeding.

		• In many of the facilities, important pieces of equipment were either missing or not functional. Most of the health centers also lacked laboratory tests such as VDRL, hemoglobin, urine protein and cross match. • Interviewed midlevel providers also had no adequate training on essential procedures like assisted vaginal delivery (vacuum extraction), manual vacuum aspiration or evacuation and curettage. In addition, about one-third have no skill to manage preeclampsia and post-abortion complications.
IV	Determine factors affecting utilization of skilled maternal care (ANC, Delivery and PNC)	• A significant heterogeneity was observed among clusters for each indicator of skilled maternal care utilization. • At individual level, preference for skilled providers and previous experience of antenatal care were consistently strong predictors of all indicators of skilled maternal health care utilization. First birth order, maternal education, and awareness about health facilities to get skilled professionals were significantly associated with skilled antenatal and delivery care utilizations. • At communal and facility level, cost requirements at health facilities, having different source of income to cover transport and service costs, and availability of important service components at health facilities were among the factors affecting skilled maternal care especially delivery service.
V	Investigate the immediate effects of using the available skilled maternal care on the health of mothers and their babies	• About 21% of women encountered at least one obstetric complication or death during delivery and postpartum period. Hemorrhage and prolonged labor were the major types. Pregnancy outcomes for 5.6% of women were fetal, neonatal or maternal deaths. • Skilled maternal care showed reduction in adverse pregnancy outcomes (complications and deaths). However, the associations were not significant due to quality related reasons. • Less than four ANC visits, four or more ANC visits, and delivery by skilled attendant showed 9% (OR=0.91; 95% CI: 0.43, 1.69), 25% (OR=0.75; 95% CI: 0.25, 2.75), and 31% (OR=0.69; 95% CI: 0.36, 1.33) reduction in the occurrence of adverse pregnancy outcomes respectively.

4.1. Socio-Demographic Characteristics of the Study Subjects

Socio-demographic characteristics of women involved in the population-based survey

In the population-based survey, 1,668 women were included. The majority (92.7%) of the women were married. At the time of their last birth, about 73.3% were between 20-34 years of age; 5.5% were teenagers (less than 20 years), and 21.2 % were elderly gravid (35 years and above). The mean ($\pm$ SD) age was 28.2 ($\pm$ 6.6) years, with a range of 16-51 years. The last birth for one-fifth of the mothers was the first, while it was the second or third for 39%; fourth or fifth for 26%, and more than fifth for 14%. The majority of the interviewed mothers (71%) and their husbands (63.4%) had no formal education (Table 3).

Socio-demographic characteristics of women involved in the follow-up study

During the follow up period, 763 pregnant women were registered and followed. The index pregnancy for 263 (34.5%) of the mothers was their first pregnancy. About 71.8% were between 20-34 years, 11.7% were teenagers (less than 20 years), and 16.5 % were elderly gravid (35 years and above). The mean age was 27.4 $\pm$ 6.8 years, with a range of 15-49 years. The majority of the interviewed mothers (67.5%) and their husbands (48.9%) had no formal education (Table 4).

Table 3: Frequency and percentage distribution of women involved in the population-based survey according to selected socio-demographic characteristics, North Gondar, 2012

Characteristics		n	%
Residence (District)	Dabat	293	17.6
	Debark	244	14.6
	Dembia	294	17.6
	L.Armachiho	228	13.7
	Metema	306	18.3
	W.Belesa	303	18.2
Religion	Orthodox	1546	93.7
	Muslim	104	6.3
Ethnicity	Amhara	1536	92.7
	Qimant	78	4.7
	Tigrawi	43	2.6
Marital status	Never married	77	4.6
	Married	1537	92.7
	Divorced	37	2.2
	Widowed	7	0.4
Birth order	1	335	20.1
	2-3	657	39.4
	4-5	439	26.3
	6+	237	14.2
Mother's education	No education	1183	70.9
	Primary	327	19.6
	Secondary	138	8.3
	>Secondary	20	1.2
Husband's education	No education	1057	63.4
	Primary	430	25.8
	Secondary	154	9.2
	>Secondary	27	1.6
Wealth index	Lowest	331	19.8
	Second	340	20.4
	Middle	306	18.3
	Fourth	357	21.4
	Highest	334	20.0

Table 4: Frequency and percentage distribution of women involved in the follow-up study according to selected socio-demographic characteristics, Dabat, 2012

Characteristics		n	%
Religion	Orthodox Christian	745	97.6
	Muslim	18	2.4
Ethnicity	Amhara	760	99.6
	Tigre	3	0.4
Marital status of mother	Unmarried (single)	28	3.7
	Married	699	91.6
	Widowed	20	2.6
	Divorced	7	0.9
	Separated	9	1.2
Number of births	1	263	34.5
	2-3	223	29.2
	4-5	168	22.0
	6+	109	14.3
Age	<20	89	11.7
	20-34	548	71.8
	35+	126	16.5
Educational status of mother	Illiterate	515	67.5
	Primary	104	13.6
	Secondary and above	144	18.9
Educational status of husband/partner	Illiterate	373	48.9
	Primary	238	31.2
	Secondary and above	152	19.9
Residence	Rural	571	74.8
	Urban	192	25.2
Occupation of husband	Farmer	586	76.8
	Merchant	40	5.2
	Government employee	78	10.2
	Others	59	7.7
Total		763	100

4.2. Utilization of Skilled Maternal Services

Skilled maternal care for uncomplicated pregnancy and childbirth

Five hundred thirty eight (32.3%, 95% CI: 30.0% to 34.5%) of the participants received ANC from a skilled provider, that is, from a doctor, health officer, and nurse/midwife for their most recent birth one year before the survey (Table 5). About 16.6%; 95% CI: 14.8% to 18.4%, of the women made four or more ANC visits during their pregnancy.

Two hundred thirty one (13.8%; 95% CI: 12.2%, 15.5%) of the births were assisted by a skilled attendant. One hundred five (6.3%; 95% CI: 5.1%, 7.5%) of the women received PNC from a skilled provider (Table 5). Of the PNC service users, however, only 10.6% and 17.8%, respectively, had checkups within two days and in the first week of postpartum period.

Table 5: Utilization of ANC, Delivery and PNC by skilled providers, North Gondar 2012

Type of Skilled provider	Women who received maternal services (From total sample n=1668)		
	ANC*	Delivery care	PNC
	n (%)	n (%)	n (%)
Doctor	23 (1.4)	35 (2.1)	2(0.1)
Health officer	22(1.3)	23 (1.4)	4(0.2)
Midwife/Nurse	493 (29.6)	173 (10.4)	90 (5.4)
Unclassified skilled provider			9(0.5)
Total	538 (32.3, 95% CI: 30.0,34.5)	231 (13.8; 95% CI: 12.2, 15.5)	105 (6.3, 95% CI: 5.1,7.5)

* Type of provider for ANC and PNC visits was considered by taking the most skilled provider involved, at least once in all visits

The majority of the women, that is, 61.2 and 90.2%, respectively, received no maternity care during their pregnancy and postpartum periods. Moreover, non-skilled providers, mainly traditional birth attendants (TBAs) and relatives assisted most women (85.8%) during their deliveries (Figure 5).

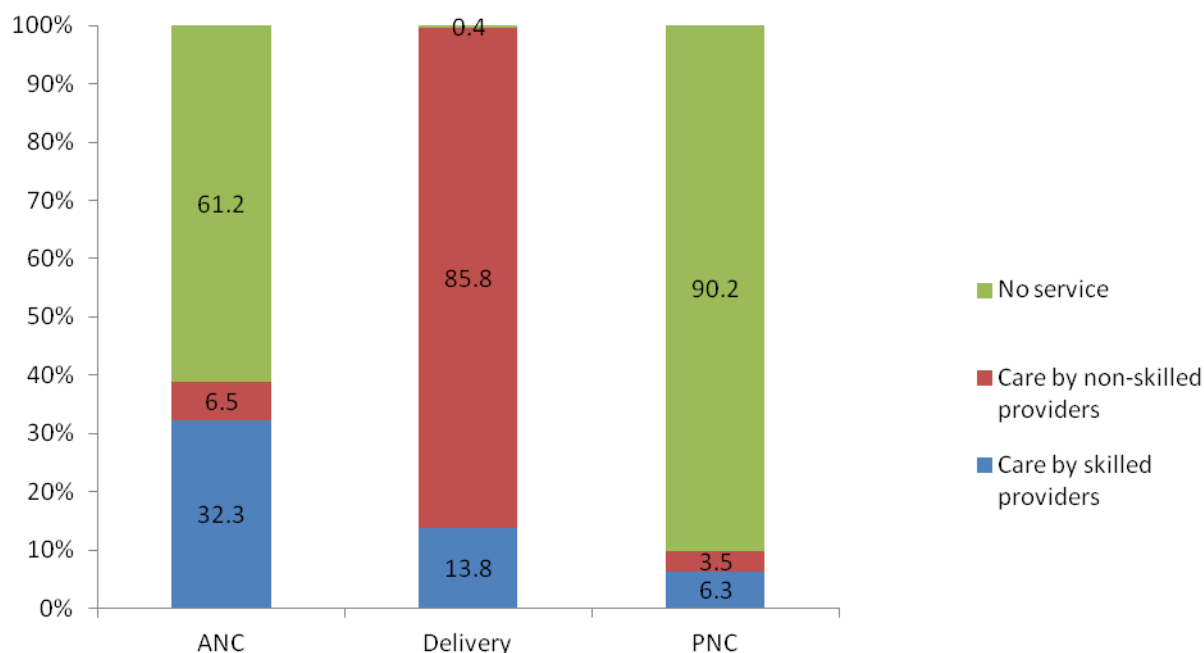


Figure 5: Utilization of ANC, delivery and PNC services, North Gondar, 2012

Seeking skilled assistance during complications

Overall, 476 women (28.5%, 95% CI: 26.4%, 30.7%) reported some kinds of complications. Ninety (5.4%), 224 (13.4%) and 274 (16.4%) of the women faced these complications during pregnancy, intra-partum and postpartum periods respectively. The most common reported complications were excessive bleeding (58.4%), and prolonged labor (23.7%). Most women encountered these complications at the time of delivery and the immediate postpartum period.

Out of the total women who faced complications, 282 (59.2%, 95% CI: 54.8%, 63.7%) sought assistance. Most, 248 (52.1%), of the assistance was by skilled providers (doctors (5.9%), health officers (4.4%) and nurses/midwives (39.5%)), and some, 34 (7.1%), was by non-skilled providers (Table 6).

Table 6: Types of providers assisting mothers at the time of complications in their last birth one year preceding the survey, North Gondar 2012

		n=476	95% CI (%)	
		No (%)	Lower	Upper
By Skilled providers	Doctor	28(5.9)		
	Health officer	21(4.4)		
	Midwife/Nurse	188 (39.5)		
	Unclassified skilled	11(2.3)		
	Total skilled	248(52.1)	47.6	56.6
By Non-skilled providers	HEW	28(5.9)		
	TBA	4(0.8)		
	Relatives	2(0.4)		
	Total	34(7.1)	4.8	9.5
Total assisted (skilled & Non skilled)		282(59.2)	54.8	63.7
No Assistance		194(40.8)	36.3	45.2

4.3. Reasons for not Using Skilled Maternal Services

Listed reasons (unprompted responses)

Women had listed their reasons for not using maternal services spontaneously. In all of the three routine maternal services, women consider it unnecessary for normal (uncomplicated) pregnancy and childbirth. About 84%, 56.5% and 90.4% of non-users of ANC, delivery care and PNC, respectively, alleged it as their reason for not using the services (Table 7).

Table 7: Major reasons for not using skilled maternal care based on unprompted responses of mothers who did not use the services, North Gondar, 2012

Top listed reasons	% for ANC	% for Delivery care	% for PNC
Respondent thought unnecessary	84.0	56.5	90.4
No time to go	28.4	42.3	27.3
Using home remedy	17.8	25.4	21.8
Husband/family thought unnecessary	16.5	15.7	19.4
No money	20.5	14.9	16.5
Facility too far	14.0	14.7	14.7
No transport	13.3	14.7	12.6
Didn't know where to go	13.1	11.5	13.2
Too expensive	12.1	10.4	12.6
Services poor	10.1	10.2	10.1

At the time of complications, women did not seek services due to the following reasons: Inability to judge the graveness of condition (38.4%), distance/transport problems (22.6%), lack of money/cost considerations (19.5%), and use of traditional options at home (13.1%). The reasons varied with relative difference in wealth. The main reason for the lowest (poorest) quintile was lack of money/cost consideration (32.8%), whereas the main reasons for the wealthiest quintile were others (26.3%), mainly quality of service (Figure 6).

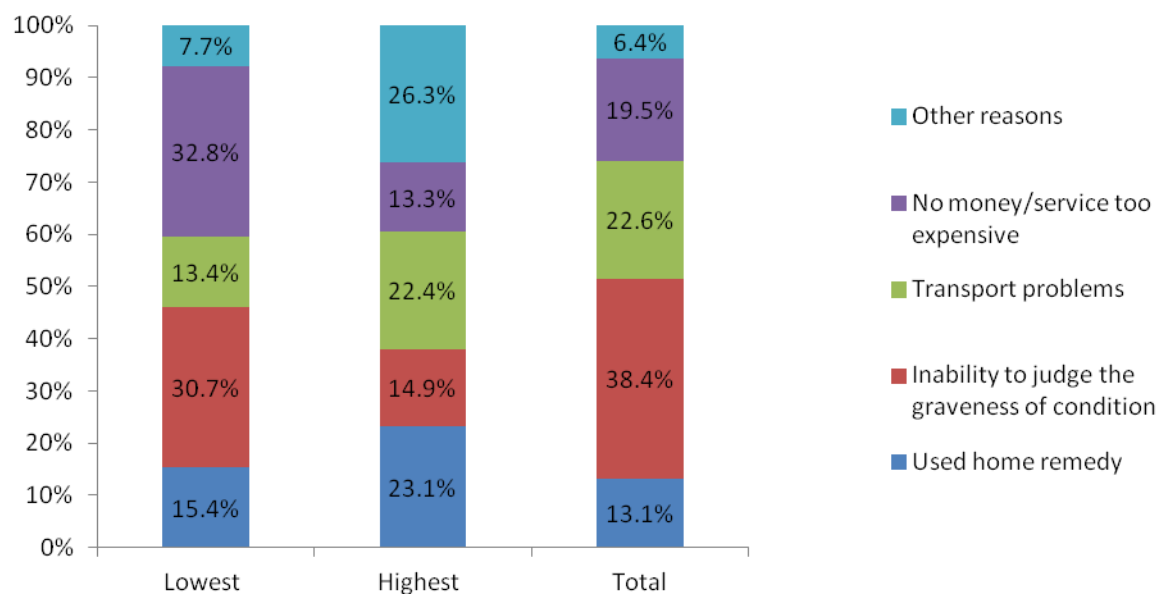


Figure 6: The main reasons for not seeking assistance at the time of obstetric complications by using wealth quintiles, North Gondar 2012

Awareness and perceptions of women

The majority (55.2%) of the women mentioned health centers as their places to get a skilled attendant. About 72.6% thought that some groups of women were at higher risk of complications compared with others. More than half of them (57%) perceived that health professionals were better and safer birth attendants. About 54.8% agreed on the need for a postnatal check up. However, only a few (15.2%) of the women supported the idea that leaving home /compound/ in the first seven days after delivery was safe. Three-fourths of the women, agreed on the importance of planning the place of delivery and for possible complications (Table 8).

Table 8: Awareness and perceptions related to obstetric complications and the need for skilled maternal care among women having birth one year preceding the survey, North Gondar, 2012

Awareness and perceptions	Frequency	%
Heard about skilled care (n=1668)	995	59.7
Heard about birth preparedness (n=1668)	985	59.1
Respondent's known place to get skilled attendants (unprompted responses) (n=1535)		
Government hospital	421	27.4
Government health center	848	55.2
Health post	48	3.1
Private clinic	10	0.7
Thought that some groups of women are at higher risk of complications than others (n=1579)	1146	72.6
Respondents considered women at higher risk (prompted responses)		
Advanced age (n=1508)	1023	67.8
Frequent births (n=1505)	801	53.2
Poor women (n=1497)	763	51.0
First pregnancy (n=1508)	729	48.3
Early age (n=1505)	660	43.9
Short stature (n=1494)	653	43.7
Multiple births (>5 five birth) (n=1505)	621	41.3
Thought that the selected delivery attendants were better (safer) than the others (n=1667)		
Health professionals	955	57.3
TBA	575	34.5
Relatives	97	5.8
Agreed on the need of post natal checkups (n=1643)	901	54.8
Agreed on the idea that leaving the house /compound/ in the first seven days after delivery had no problem (n=1634)	248	15.2
Agreed on the importance of planning delivery place (n=1632)	1236	75.7
Agreed on the need of having a plan for possible complications (n=1606)	1195	75.5

From the in-depth interview, the following five important themes were identified for the questions „why home birth?“ and „why no skilled maternal service?“

1. Low perceived risk of pregnancy

Almost all respondents believed that it was not mandatory to visit health facilities without any morbidity. Most of the responses for the questions related to the importance of visiting health facilities during normal pregnancy, delivery, and postpartum period was *“If there is no problem why should women visit health facilities?”* That means it is not necessary to go to health facilities or to seeking skilled health professionals if the pregnancy and childbirth were normal.

2. Home birth considered as a norm

Many women considered home birth as the norm of the community. It was the appropriate and acceptable place for childbirth to get family support and perform social ceremonies (rituals) believed to be important for the health of the mother and the newborn. Homebirth was also believed to be the ideal place to protect postpartum mothers from malevolent spirits. Hence, women were not allowed to leave their home in the early postpartum period, especially in the first 10 days. Because of this belief, postnatal service was unlikely if there was no severe morbidity.

3. Negative perception towards health facility services

Bad experiences and unwelcome attitude towards health facilities hindered the use of maternal care services. Many of the informants reflected their experience in health facilities. Some lacked confidence in health facilities since they did not function according to their expectations. Many women disliked having episiotomy, which they called „operation“. They believed that it was a damaging procedure for them. They also complained about the poor privacy (exposing genital organs) of health centers.

4. Negative perception towards maternal care providers

Many informants perceived health care providers had poor skill for delivery services. Some reflected their confidence in TBAs rather than health care providers. TBAs are within the culture of the community and were suitable for their tradition. They were preferable because they have the capacity to handle problems to which communities are sensitive.

The respondents reported negative reflections on the carrying attitude of the health center staff. Some clients mentioned the names and actions of such providers. They complained that health

workers were not available at emergency time, especially at night. Some of them had no interest in giving care when they were assigned to duty, according to the complaints.

5. Transportation difficulty and cost

The respondents emphasized the problem of transportation during childbirth and emergency conditions owing to sudden onsets of labor and lack of readiness.

“When we want to take our wives to health facilities, the transportation is very difficult, especially during rainy seasons and at night. We use „Karęa” (stretcher) for transportation up to the main road. Then we find a car, always expensive, to reach Gondar Hospital. We need to borrow at least Br 1000 to cover the car fare.”

4.4. Availability and Components of Maternal Services

Available services at health centers and hospitals

Five out of the 12 health centers and all the three hospitals fulfilled the criteria of signal functions for basic obstetric care, but only Gondar Hospital fulfilled all the signal functions of comprehensive emergency obstetric care. All of the facilities (hospitals and health centers) reported that they had ANC and family planning (FP) services. Many health centers did not have laboratory tests for hemoglobin, urine for proteinuria, and cross match (Table 9).

Observation of the facilities showed that essential drugs, including antibiotics, intravenous fluids, vaccines and contraceptives were available in the 15 selected facilities. Availability of supplies, like gloves, and syringes was also adequate. However, basic equipment and facilities were either missing or nonfunctional/unsatisfactory.

Table 9: Availability of maternal services and laboratory tests in basic and comprehensive obstetric care facilities (selected health centers and all hospitals) in North Gondar, 2012

Type of services available in the facility	Number of visited facilities		
	Health centers (12)	Hospitals (3)	Total (15)
<i>Availability of selected maternity related services</i>			
Antenatal care	12	3	15
Delivery care	11	3	14
Postnatal care in the first 7 days	9	3	12
Family planning	12	3	15
VCT	10	3	13
PMTCT	11	3	14
Safe abortion	5	3	8
Maternity service for 24 hrs and 7days a week	9	3	12
Working ambulance (referral service)	3	2	5
<i>Signal functions to treat major obstetric complications</i>			
Parenteral antibiotics	11	3	14
Parenteral oxytocics	11	3	14
Anticonvulsants	5	3	8
Manual removal of placenta	9	3	12
Removal of retained products	10	3	13
Assisted vaginal delivery	7	2	9
Cesarean section	0	1	1
Blood transfusion	0	2	2
<i>Availability of selected laboratory tests</i>			
Syphilis testing (VDRL)	0	3	3
Hemoglobin test	5	3	8
Urine test-protienuria	6	3	9
Blood film-malaria	11	3	14
HIV test	12	3	15
Cross match tests	5	2	7

Components of maternal services according to provider reports

Skilled care providers, who are directly involved (assigned) in maternity care at basic obstetric care facilities (health centers and district hospitals), were interviewed. According to them, adequate training or on-the-job experience was obtained by the majority of the providers for different types of procedures (Table 10).

Table 10: Number and percentage of skilled providers getting training or on-the-job experience for different types of procedures, North Gondar, 2012

Type of procedures	Qualification of provider					
	Health officer (n=9)		Nurse/midwife (n=29)		Total (n=38)	
	n	%	n	%	n	%
ANC risk screening	8	88.9	26	89.7	34	89.5
Partograph utilization	7	77.8	23	79.3	30	78.9
IV infusion	9	100	28	96.6	37	97.4
Speculum examination	7	77.8	15	51.7	22	57.9
Bimanual examination	8	88.9	19	65.5	27	71.1
Compress uterus	7	77.8	20	69.0	27	71.1
External version	1	11.1	4	13.8	5	13.2
Internal version	0	0	3	10.3	3	7.9
Episiotomy	9	100	24	82.8	33	86.8
Repairing cervical laceration	0	0	5	17.2	5	13.2
Repairing vaginal tears	8	88.9	23	79.3	31	81.6
Repairing third/fourth degree tear	1	11.1	11	37.9	12	31.6
Active management of third stage	9	100	28	96.6	37	97.4
Manual removal of placenta	9	100	26	89.7	35	92.1
Assisted vaginal delivery (Vacuum extraction)	6	66.7	11	37.9	17	44.7
Manual vacuum aspiration	6	66.7	11	37.9	17	44.7
Evacuation and curettage	5	55.6	5	17.2	10	26.3

Providers reported that they routinely performed most of the ANC screening procedures, like checking blood pressure, anemia, fetal heartbeat, malaria and HIV. However, only 24% of them used partograph consistently at the time of delivery care, and some had no skills to manage common obstetric complications (Table 11).

Table 11: Reports of skilled care providers performing the following procedures to women who present for maternity care in the past three months, North Gondar, 2012

Types of services	Qualification of provider				Total (n=38)	
	Health officer (n=9)		Nurse/midwife (n=29)			
	n	%	N	%	n	%
Routinely perform the following steps/check-up to women who present for antenatal care						
Take medical history	9	100	29	100	38	100
Check BP	9	100	29	100	38	100
Check anemia	9	100	29	100	38	100
Check fetal heart beat	9	100	29	100	38	100
Provide iron/folic acid supplement	8	88.9	27	93.1	35	92.1
Check malaria	9	100	28	96.6	37	97.4
Test proteinuria	7	77.8	20	69.0	27	71.1
Test syphilis	4	44.4	11	37.9	15	39.5
Counsel on self care	9	100	27	93.1	36	94.7
Counsel on delivery plan	9	100	29	100	38	100
Discuss nutrition	9	100	29	100	38	100
Tell due date	9	100	29	100	38	100
Discuss funds for expense	6	66.7	26	89.7	32	84.2
Discuss on transport	9	100	23	79.3	32	84.2
Discuss on blood donors	4	44.4	18	62.1	22	57.9
Discuss VCT	9	100	27	93.1	36	94.7
Discuss PMTCT	9	100	26	89.7	35	92.1
Routinely perform the following at the time of delivery care						
Checking laboring mother frequently according to the recommended standard	5	55.6	11	37.9	16	42.1
Partograph use at least once	5	55.6	14	48.3	19	50.0
Partograph use almost always	4	44.4	5	17.2	9	23.7
Introducing for client	4	44.4	18	62.1	22	57.9
Allow family to enter	9	100	25	86.2	34	89.5
Protecting privacy by screen/clothes	9	100	28	96.6	37	97.4
Explain procedures	8	88.9	27	93.1	35	92.1
Tell the progress of labor	9	100	28	96.6	37	97.4
Tell about possible outcomes	8	88.9	26	89.7	34	89.5
Keep comfort of laboring mother	9	100	29	100	38	100
Advise to have postpartum care (1 st wk)	6	66.7	15	51.7	21	55.3
Routinely perform the following at the time of postpartum care						
Abdominal examination	9	100	24	82.8	33	86.8
Vaginal examination	8	88.9	18	62.1	26	68.4
Checking BP	9	100	29	100	38	100
Assessing abnormal bleeding	9	100	29	100	38	100
Inspection of lochia	9	100	26	89.7	35	92.1
Discussing FP	9	100	29	100	38	100
Advise BF	9	100	29	100	38	100
Checking baby	9	100	27	93.1	36	94.7
Management of selected complications						
Preclampsia	8	88.9	18	62.1	26	68.4
Severe bleeding	9	100	27	93.1	36	94.7
Retained placenta	9	100	28	96.6	37	97.4
Post abortion care	7	77.8	19	65.5	26	68.4

Components of maternal services provided according to user reports

Table 12: Essential services received by women during their ANC visits and delivery care by types of skilled attendants according to women's response, North Gondar, 2012

Types of services	Qualification of provider							
	Doctor		Health officer		Midwife/Nurse		Total	
	Yes	%	Yes	%	Yes	%	Yes	%
Services received by women during their ANC visits by a skilled attendant								
Medical history evaluated	19	82.6	19	86.4	425	86.2	463	86.1
Blood pressure measured	19	82.6	18	81.8	390	79.1	427	79.4
Weight measured	18	78.3	20	90.9	375	76.1	413	76.8
Blood sample taken	17	73.9	19	86.4	349	70.8	385	71.6
Urine sample taken	9	39.1	11	50.0	168	34.1	188	34.9
TT immunization provided	9	39.1	10	45.5	223	44.8	242	45.0
Anti malaria drugs provided	9	39.1	10	45.5	211	42.8	230	42.8
Iron /folic acid provided	15	65.2	15	68.2	315	63.9	345	64.1
Expected due date told	10	43.5	12	54.5	244	49.5	266	49.4
Nutrition advise provided	16	69.6	16	72.7	302	61.3	334	62.1
Fetal growth updated	10	43.5	12	54.5	292	59.2	314	58.4
Birth preparedness discussed	11	47.8	11	50.0	250	50.7	272	50.6
Needed materials for delivery discussed	9	39.1	12	54.5	242	49.1	263	48.9
Place of birth discussed	15	65.2	15	68.2	300	60.9	330	61.3
Advised to go health facility at time of birth	16	69.6	14	63.6	304	61.7	334	62.1
Saving funds discussed	7	30.4	12	54.5	224	45.4	243	45.2
Discussion on danger signs	9	39.1	14	63.6	258	52.3	281	52.2
Discussions on complications during delivery or postpartum	11	47.8	12	54.5	254	51.5	277	51.5
Discussed to go Health facility at time of complication	15	65.2	14	63.6	254	51.5	283	52.6
Discussed to prepare blood donor	9	39.1	10	45.5	183	37.1	202	37.5
Discussed on HIV testing	17	73.9	19	86.4	348	70.6	384	71.4
Discussed about PMTCT	13	56.5	17	77.3	347	70.4	377	70.1
Discussed about other STIs	8	34.8	8	36.4	233	47.3	249	46.3
Total	23	100	22	100	493	100	538	100
Services received by women during their delivery care by a skilled attendant								
General health assessment	28	80.0	20	87.0	151	87.3	199	86.1
Blood pressure & other vital signs	29	82.9	17	73.9	138	79.8	184	79.7
Per vaginal examination	28	80.0	17	73.9	140	80.9	185	80.1
Abdominal examination	31	88.6	21	91.3	158	91.3	210	90.9
Auscultation of fetal heart beat	31	88.6	21	91.3	153	88.4	205	88.7
Control bleeding by drugs	28	80.0	22	95.7	134	77.5	184	79.7
Information on progress of labor	28	80.0	17	73.9	136	78.6	181	78.4
Keep comfort of mother	29	82.9	20	87.0	132	76.3	181	78.4
Give care for the baby	26	74.3	17	73.9	124	71.7	167	72.3
Measure and record baby weight	18	51.4	15	65.2	121	69.9	154	66.7
Give vaccine for baby	27	77.1	14	60.9	118	68.2	159	68.8
Advise about breast feeding	27	77.1	17	73.9	137	79.2	181	78.4
Advise on infant care	21	60.0	12	52.2	94	54.9	127	55.0
Total	35	100	23	100	173	100	231	100

* Number of service users who said "Yes" during the interview and percentage within type of the provider was calculated

4.5. Factors Affecting Utilization of Skilled Maternal Care

Factors associated with the routine skilled maternal services (multilevel analysis)

The multilevel analysis started from the intercept-only model to test the null hypothesis that there was no variation in maternal health service utilization among clusters (kebeles) and to decide the evaluation of the random effects at the community level. The results indicated that a considerable heterogeneity was observed among kebeles for each indicator of skilled maternal care utilization. For all the three indicators, the use of service is clustered significantly by the kebele. The intra-class correlation in the empty model for antenatal, delivery, and postnatal care by skilled provider indicated that 31%, 12%, and 25% of the total variance in use of the services was attributable to the differences across kebeles.

Preference for skilled providers and previous experience of antenatal care were consistently strong predictors of all indicators of skilled maternal health care utilizations. Birth order, maternal education, and awareness about health facilities to get skilled professionals were consistently strong predictors of skilled antenatal and delivery care use. Communal factors were relevant for both delivery and postnatal care, whereas the characteristics of a health facility were more important for use of skilled delivery care than other maternity services (Table 13).

Table 13: Results of the multilevel analysis by predictors of skilled maternity care, North Gondar, 2012

Predictors		n	Adjusted odds ratio (95% CI)		
Level-1 predictor variables (Individual and household characteristics)			ANC	Delivery care	PNC
Birth order	1	335	1	1	1
	2-3	657	0.75 (0.53, 1.07)	0.60 (0.40, 0.90)	0.98 (0.56, 1.71)
	4-5	439	0.66 (0.44, 0.99)	0.51 (0.32, 0.85)	0.58 (0.28, 1.20)
	6+	237	0.79 (0.50, 1.25)	0.55 (0.31, 0.96)	0.60 (0.26,1.38)
Mother's education	No education	1183	1	1	1
	Primary	327	1.09 (0.80, 1.50)	1.17 (0.79, 1.72)	1.31 (0.76, 2.24)
	Secondary and above	158	1.68 (1.08, 2.60)	1.94 (1.21, 3.10)	1.72 (0.86, 3.47)
Husband education	No education	1057	1	1	1
	Primary	430	1.34 (0.98, 1.82)	0.83 (0.56, 1.22)	0.83 (0.49, 1.39)
	Secondary and above	181	1.22 (0.77, 1.94)	1.27 (0.77, 2.11)	0.85 (0.43, 1.70)
Wealth quintile	Lowest	331	1	1	1
	Second	340	1.02 (0.69,1.51)	1.08 (0.66, 1.78)	0.97 (0.44, 2.14)
	Middle	306	1.14 (0.75, 1.72)	1.24 (0.74, 2.08)	2.08 (1.01, 4.28)
	Fourth	357	1.03 (0.68, 1.56)	1.51 (0.92, 2.46)	1.35 (0.63, 2.86)
	Highest	334	0.83 (0.54, 1.27)	1.21 (0.71, 2.05)	1.44 (0.67, 3.13)
Awareness on risk of pregnancy	No	522	1	1	1
	Yes	1146	1.35 (0.96, 1.89)	1.10 (0.82, 1.75)	1.52 (0.79, 2.93)
Health professionals preferred for the care	No	713	1	1	1
	Yes	955	1.64 (1.14, 2.36)	2.29 (1.50, 3.51)	2.45 (1.31, 4.60)
Awareness on places to get skilled provider	No	341	1	1	1
	Yes	1327	1.63 (1.07, 2.49)	2.83 (1.54, 5.20)	1.48 (0.64, 3.42)
Pregnancy wontedness	Wanted/mistimed	1511	1	1	1
	Unwanted	157	0.79 (0.51, 1.22)	0.59 (0.34, 1.03)	0.67 (0.31, 1.42)
ANC in previous pregnancy	No	957	1	1	1
	Yes	711	3.39 (1.98, 5.80)	1.80 (1.31, 2.49)	1.92 (1.20, 3.08)
Skilled ANC for this pregnancy	No	1130		1	1
	Yes	538		1.90 (1.37, 2.63)	0.76 (0.48, 1.20)
Level 2 predictor variables					
Communal (kebele) characteristics					
Main source of income	Farming	1214	1	1	1
	Mixed	454	1.35 (0.47, 3.88)	1.64 (1.18, 2.28)	1.54 (1.03, 2.30)
Self sustained	No	445	1		
	Yes	1223	1.29 (0.21, 8.09)		
Average distance to the nearest health center			0.83 (0.46, 1.48)	0.84 (0.69, 1.03)	0.80 (0.63, 1.02)
Health facility characteristics					
Signal functions	One or more missed	583	1	1	1
	All present	1085	1.14 (0.24, 5.51)	1.96 (1.13, 3.40)	1.16 (0.58, 2.35)
Availability of obstetric guidelines	No	900			1
	Yes	768			1.13 (0.59, 2.18)
Payment requirements during delivery	No	1252		1	
	Yes	416		0.53 (0.32, 0.88)	
Overall infrastructure	Not satisfactory	1153	1	1	1
	Satisfactory	515	1.64 (0.39,6.92)	0.98 (0.64, 1.51)	1.51(0.74, 3.10)
Basic equipments	Not satisfactory	878		1	
	Satisfactory	790		1.12 (0.73, 1.72)	

Random part			
Var (ANC in previous preg)	0.62 (0.22, 1.80)	-	-
Var (Preference of H. professionals for the care)	0.07 (0.14, 4.05)	-	-
Var(cons) i.e. level-2 variance	0.76 (0.41, 2.21)	5.64e-19	2.13e-18
Rho - Intra-class correlation	0.19	Nearly 0	Nearly 0
Deviance (G^2)	1652	1167	670

Factors associated with seeking assistance at the time of obstetric complications

After the adjustment of potential confounders using logistic regression, three variables showed a significant association with seeking assistance from a skilled provider during complications. Wealthier women, who belonged to the second quintile, were 2.5 times (OR=2.5, 95% CI; 1.3, 4.6) more likely to be assisted by a skilled provider than women in the poorest quintile. Women who had antenatal care by a skilled providers were 1.7 times (OR=1.7, 95% CI; 1.1, 2.7) more likely to seek assistance from a skilled provider compared with women who did not have antenatal care. Similarly, mothers who were ready for possible complications were 2.5 times (OR = 2.5, 1.6, 3.9) more likely to seek assistance from a skilled provider at the time of obstetric complication compared with women who were not ready.

4.6. The Contributions of Using the Available Maternity Services to Reduce Adverse Pregnancy Outcomes

Summary of the cohort study from exposure assessment to outcome ascertainment

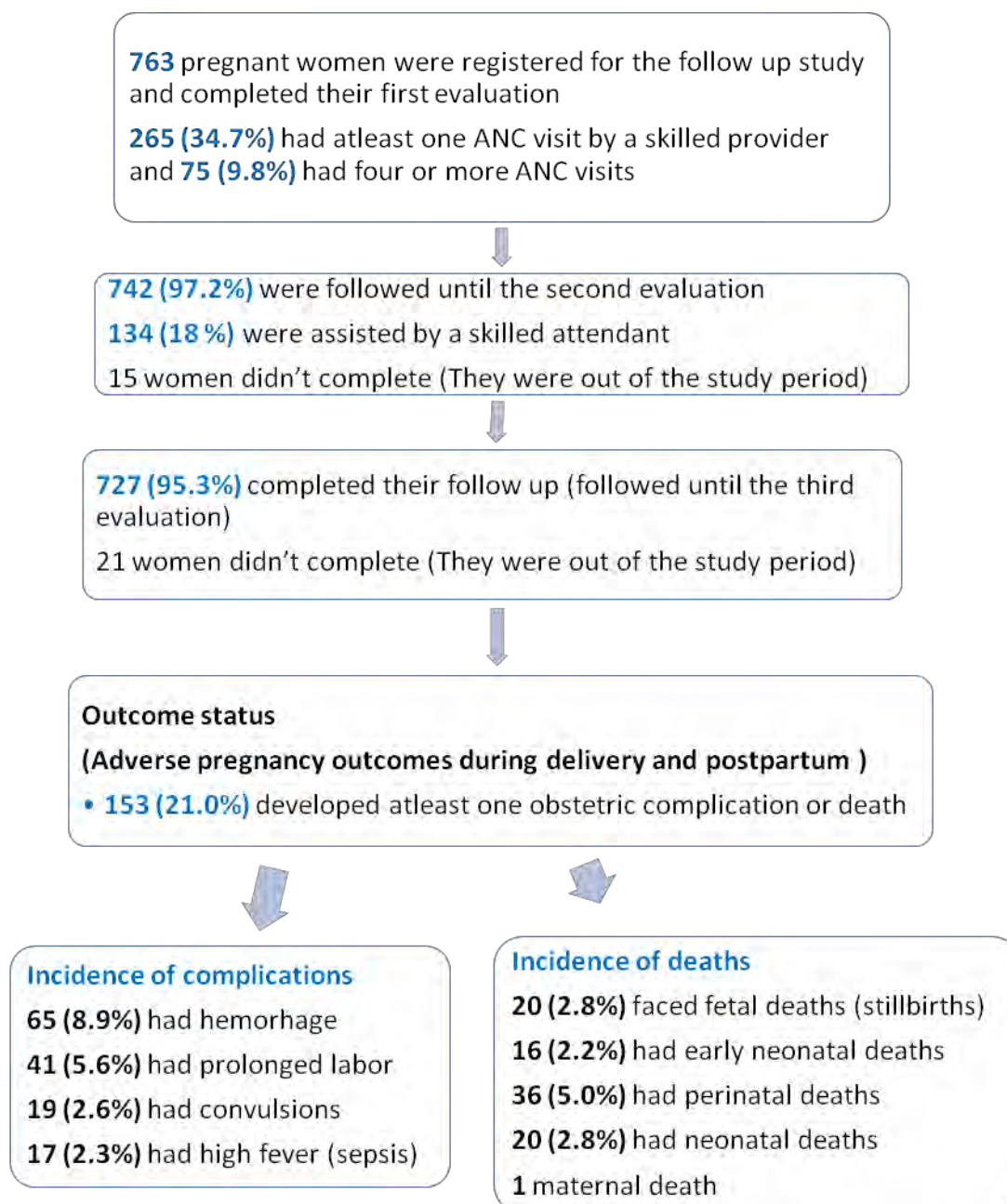


Figure 7: Flowchart of the cohort study from exposure assessment to outcome ascertainment

The effect of maternity care by skilled providers on reducing obstetric complications

After controlling potential confounders, the chance of occurrence of adverse pregnancy outcomes was reduced by 9% (OR=0.91; 95% CI: 0.43, 1.69) among mothers with less than four ANC visits and by 25% (OR=0.75; 95% CI: 0.25, 2.75) among mothers with four or more ANC visits. In addition, delivery by skilled attendant showed a 31% (OR=0.69; 95% CI: 0.36, 1.33) reduction in the occurrence of complications and death during delivery and postpartum period. However, the findings were not significant. Living in rural area was found to be a significant risk factor for the occurrence of at least one type of complication or death (Table 14).

Table 14: The effect of skilled maternal care on reducing occurrence of the complications and death during delivery and postpartum period without and with adjustment of possible confounders

Variables		At least one complication at birth or postpartum			
		n =727	n (%)	Crude OR (95% CI)	Adjusted OR (95% CI)
Delivery by skilled provider	No	598	133 (22.2)	1	1
	Yes	129	20 (15.5)	0.64 (0.38, 1.07)	0.69 (0.36, 1.33)
ANC by skilled provider	No or non-skilled	474	107 (22.6)	1	1
	1-3 visits by skilled	184	39 (21.2)	0.92 (0.61, 1.40)	0.91 (0.43, 1.69)
	4+ visits by skilled	69	7 (10.1)	0.39 (0.17, 0.87)	0.75 (0.25, 2.75)
Birth order	1	249	38 (15.3)	1	1
	2-3	214	48 (22.4)	1.61 (1.00, 2.57)	1.54 (0.88, 2.71)
	4-5	161	44 (27.3)	2.09 (1.28, 3.41)	1.70 (0.90, 3.20)
	6+	103	23 (22.3)	1.60(0.90, 2.85)	1.21 (0.57, 2.59)
Age	<20	85	17 (20.0)	1	1
	20-34	522	105 (20.1)	1.01 (0.57, 1.79)	0.77 (0.38, 1.53)
	35+	120	31(25.8)	1.39 (0.71, 2.72)	0.98 (0.41, 2.37)
Educational status of mother	Illiterate	497	120 (24.1)	1	1
	Primary	99	20 (20.2)	0.80 (0.47, 1.35)	0.94 (0.52, 1.67)
	Secondary and above	131	13 (9.9)	0.35 (0.19, 0.64)	0.46 (0.18, 1.14)
Educational status of husband /partner	Illiterate	358	87 (24.3)	1	1
	Primary	226	46 (20.4)	0.80 (0.53, 1.19)	1.15 (0.75,1.75)
	Secondary and above	143	20 (14.0)	0.51 (0.30, 0.86)	0.59 (0.26, 1.33)
Residence	Rural	549	135 (24.6)	1	1
	Urban	178	18 (10.1)	0.35 (0.20, 0.58)	0.32 (0.16, 0.66)
Pregnancy wanted	No	175	40 (22.9)	1	1
	Yes	552	113 (20.5)	0.87 (0.58, 1.31)	0.80 (0.51, 1.26)
Contraceptive used before pregnancy	No	449	106 (23.6)	1	1
	Yes	278	47 (16.9)	0.66 (0.45, 0.97)	0.72 (0.46, 1.10)
History of abortion or still birth	No	586	117 (20.0)	1	1
	Yes	141	36 (25.5)	1.37 (0.90, 2.11)	1.24 (0.79, 1.96)

V. Discussion

This study concentrated on the assessment of skilled maternal care utilization and their determinant factors using mixed study approaches. Both quantitative and qualitative data collection techniques were applied to gather data on skilled maternal care utilization and their potential correlates. The linked facility and population-based survey contributed to assess such utilizations and to examine the effects of the potential factors using multilevel modelling. In addition, the prospective cohort study helped to evaluate the effects of the available skilled maternal care in reducing adverse pregnancy outcomes. The details of the discussion are presented in the following paragraphs.

5.1. Utilization of Skilled Maternal Care

The observed low skilled ANC utilization was similar with the recent EDHS report (11). According to the new WHO antenatal care model, all pregnant women should have at least four ANC assessments by or under the supervision of a skilled attendant (30). However, only 16.6% of women made four or more ANC visits during their pregnancy in this study. This indicated that the coverage could not be sufficient to address the desired goals of ANC at the population level.

Skilled attendance at the time of delivery is considered as a key intervention for maternal survival since complications are not predicted (6). However, the majority of the births (86%) occurred at home and was attended by TBAs and relatives. This finding is in line with previous studies conducted in Ethiopia (11, 45).

Although postnatal evaluation by skilled providers is extremely important, as most maternal deaths are happening in the early postpartum period (9), this study revealed that a very small number of mothers (6.3%) had PNC by a skilled attendant. This finding is consistent with Ethiopian DHS reports (11, 36, 52).

Nearly half of the women who faced complications did not receive assistance from skilled providers. The utilization rate was low compared with reports from other developing countries. For instance, in rural Haiti, 75% of pregnant women reported seeking care from the formal health sector for a pregnancy-related illness (113). The differences may be due to the overall maternal service utilization pattern which is very low in Ethiopia (11). The survey definition of

complications may also inflate the prevalence of complications compared with the clinical definitions.

5.2. Determinants of Skilled Maternal Care

This study assessed the effect of individual, household, communal and health facility characteristics in the utilization of antenatal, delivery, and postnatal care by a skilled provider using multilevel modeling. Logistic regression was also applied to analyze the determinants of skilled assistance at the time of complications. Our analysis indicated that utilization of skilled maternal care by individual women depended on the joint effect of individual, household, communal and facility characteristics. As observed in previous studies (72, 114), determining association without controlling variables at different levels would give a misleading result.

Awareness and perceptions

Having awareness about health facilities to get skilled professionals was a significant predictor of both skilled antenatal and delivery care. Awareness on planning for possible complications was also significantly associated with seeking skilled assistance during a complication. Moreover, significantly higher utilization rate of all skilled maternal health service indicators was observed among women who perceive that health professionals are better and safer (prefer skilled providers) for their maternity care. The implications of this finding is that community based health education about the benefits of skilled maternal care by targeting women who prefer non-skilled providers as well as improving the quality of care by providers will have a positive contribution to utilizing skilled maternal care. The contributions of awareness to maternal care seeking behavior was also observed in community-based interventions focusing on awareness creation (63).

The top reason for not using skilled ANC, delivery, and PNC services was „because they did not consider them necessary for normal conditions“. Similarly, the main reason for not seeking skilled assistance at the time of complication was inability to judge the graveness of the condition. This was identified as one of the major reasons for the delays or for not seeking service at the time of obstetric complications by different studies (115, 116). In both cases, the top listed reason is associated with poor awareness and perceptions related to skilled maternal

care and complications. In this study, two-fifths of the women did not hear about skilled maternal care and the importance of birth preparedness. Significant proportions of women were also not able to mention danger signs and did not think about the presence of risk for developing complications. This was further validated by the qualitative findings. The in-depth interview indicated that there was a low perceived risk of pregnancy in the community, and there was a belief that it was not mandatory to visit health facilities without any morbidity. The most frequent response was *“If there is no problem why should women visit health facilities?”*

In the study area, seeking postnatal service in the early postnatal period is unlikely for normal conditions. During the postpartum period, especially in the first 10 days, women are not allowed to leave their house due to the belief in the community that they are vulnerable to malevolent spirits. According to the local tradition, postpartum complications and postpartum psychosis (in Amharic, „Menekat“) are associated with evil spirits bearing different names, like „stelay or stelay senay“, „tezewawari“, „telalafi“, „buda“. As a result, during complications, women may not seek or may seek skilled assistance after trying the traditional options (68).

Educational status

Skilled maternal care during pregnancy, delivery, and postnatal period increased steadily with education. The significant effect of secondary and higher education on skilled antenatal and delivery care clearly indicates its relevance for raising awareness and health seeking behavior of women. The contributions of better educational status is observed in previous studies conducted in Ethiopia and abroad (36-44, 72, 76, 117). In this study, the majority of the interviewed women (71%) were illiterate. This indicates that most women are disadvantaged, so targeting illiterate women will have greater public health significance.

Previous maternal care experiences

In this study, women with at least one antenatal care in previous pregnancies had a significant contribution to utilizing skilled ANC, delivery and PNC for their recent pregnancy. Furthermore, at the time of complications, having ANC by skilled providers was significantly associated with seeking skilled assistance. The contribution of ANC to further maternal service utilization, was also observed in previous studies conducted in Ethiopia (45) and elsewhere (58, 60, 114). Its

positive effect on timely care-seeking during obstetric complications was also observed in studies outside Ethiopia (118).

Unlike ANC, previous history of care during delivery, postpartum or complications did not show significant contributions to the current skilled maternal services. A study conducted in a similar setting witnessed that most mothers who had previously attended for institutional delivery subsequently gave birth at home (64). There could be several reasons for this. On the one hand, women may not acquire the necessary knowledge in a short period of contact and emergency situations during delivery or at the time of complications. Due to this, the provided information or advice could not be sufficient to bring a change in perceptions and health seeking behavior of women. However, during ANC, women have sufficient time and relaxed moments to discuss about their plan for delivery place, type of providers and preparation for possible complications. On the other hand, women may prefer to give birth at home, if they had unappealing obstetric care at health facilities. Additionally, in areas where homebirth is the norm, women may prefer the home if their previous births at the health institutions were normal. This finding was supported by the qualitative findings. During the in-depth interview, negative perceptions towards health institutions and care providers were identified as important barriers to seeking skilled care. Homebirth was also considered as the norm in the area.

Overall, the finding indicated that ANC is an important entry point for a mother to seek skilled providers for her subsequent maternal care. According to WHO, „All pregnant women should have a written plan for birth and for dealing with unexpected adverse events, such as complications or emergencies, and should discuss this plan with a skilled attendant at each antenatal assessment and at least one month prior to the expected date of birth“ (119). ANC will have more benefits, especially if this recommendation is implemented. However, only one-third of the women had ANC by a skilled provider, and incomplete components of the service are provided in the study area. Unless improved, the current coverage of ANC may not have any impact at the population level.

Birth order

Birth order as a predictor indicated that women tended to use skilled maternal care if their birth was the first, and its significant effect was observed in antenatal and delivery care. Although the

trend was tested linear, the declining trend of the odds ratios did not continue until the last category. This difference could be related to the risk perception of women that varies overtime. Many (48.3%) women believed the first pregnancy was risky compared with the next consecutive pregnancies. However, as the number of pregnancies exceeds a certain limit, women start to think about the risk associated with repeated births. Because of this reason, a significant proportion (41.3%) of the women believed that having too many births is risky for a woman.

Capacity to cover costs

In this study, payment requirement at the time of delivery was an important barrier to delivery service by a skilled provider. The in-depth interview also showed the presence of challenges to cover transportation costs, especially at the time of complication. Different studies indicate that maternity services, especially delivery care is costly. It involves economic, social and cultural costs (74, 120). As a result, substantial proportion of antenatal care users did not deliver by a skilled provider. Women's capacity to cover the expected expenses associated with maternity services is one of the factors that affect women's health seeking behavior. Evidences show that delivery care use among antenatal care users is highly correlated with wealth (capacity to pay) (57). In this study, better wealth status contributed positively to all maternity service indicators and its effect was significant for postnatal care.

Furthermore, one of the wealth indicators at the kebele level indicated that utilization of skilled delivery and postnatal cares were significantly higher among women living in kebeles with mixed (farming and trading) source of income compared with those living on farming only. The finding indicates that it is important to have different sources of income for covering payments of transportation and other services.

Taken as a whole, inability to cover costs of transport or service is an important barrier to the utilization of skilled maternal care, so there should be mechanisms to reduce or avoid the costs of maternal services. A study conducted in Tanzania indicated that subsidizing maternity care, especially for those in the lowest socio-economic category, increased service utilization (74). Currently, Ethiopia pursues free maternal service policy. However, that some facilities with retail pharmacies, demand payment for supplies and transportation cost are still a big challenge in the study area and other parts of the country.

Distance of facilities and transportation problems

Though not statistically significant (may be due to the power of the study), distance showed a negative effect on the utilization of all types of skilled maternal services. Furthermore, the qualitative findings indicated that absence of nearby health facilities and transport problems were among the major barriers to utilizing maternal services, especially at the time of delivery and complications. This was also observed in previous studies (121). As mentioned earlier, at the time of delivery, due to the sudden onset of labor and complications, women may not have adequate preparations to arrange transportation. As a result, they prefer to have homebirth by non-skilled providers and try traditional options for treating complications.

Hence, care for delivery and complications require health facilities nearby which is challenging in the study area and most parts of Ethiopia. The average distance to reach a nearby basic obstetric care facilities (health centers) was about 5.5 ± 4 km. However, villages have quite different distances and road qualities. In some villages, a sick person is transported along difficult roads using locally prepared stretchers, carried on the shoulder of persons. In the case of some complications, like obstructed labor, women need to travel long distances to reach a hospital with comprehensive emergency obstetric care (that is only Gondar Hospital in the zone).

Availability of important service components (quality of care)

Women may not use maternal services if they perceive that the performance of the health facility is below their expectation, or if it does not have the important components of services. In this study, the presence of all the six signal functions in the nearby basic essential obstetric care facility (health center) positively contributed to the utilization of all indicators of skilled maternal services, and its effect was significant on skilled birth attendance. In this case, the presence of all signal functions reflects better performance (quality) of a health facility. Although maternity and related services including antenatal and delivery care were available in most of the visited facilities, the majority had no important components of services, and they were not fully functioning for emergency obstetric care (EmOC) according to their level. This is also a common problem in other areas (87, 122). In the zone, only one hospital met the criteria for comprehensive EmOC (performs cesarean section). However, the size of the zonal population

needs about six such hospitals according to the recommended standard for one comprehensive EmOC facility for 500,000 people (1).

Beyond its effect on health-seeking behavior of mothers, providing incomplete or poor quality maternal service has incalculable costs. When important components are missing, programs will fail to achieve the goals of maternity services of reducing morbidity and mortality. In the follow up study, even ANC with four or more visits did not show a significant contribution to the reduction of unwanted pregnancy outcomes (complications and deaths) unlike in other studies (123). This was primarily due to the quality of care. For instance, the majority of ANC users did not have urine examinations, and syphilis screening was very rare in both the cross-sectional survey and the follow-up study. The absence of such important screening services will undermine the efforts to prevent preterm labor or stillbirth due to urinary tract infections like pyelonephritis or syphilis. Low coverage of tetanus immunization also diminishes the success of ANC in reducing neonatal death due to tetanus infection. Moreover, inadequate or lack of discussion about birth preparedness and complication readiness can affect outcomes in many ways.

Similarly, delivery by skilled providers did not show significant contribution to reducing the occurrence of complication or deaths. One of the major reasons could be the content of the service provided. The findings indicated that many women were not informed about labor progress and fetal conditions indicating inadequate monitoring of labor. For that matter, few providers used partograph consistently. Counseling and advice on different types of maternal and childcare were also unsatisfactory. The other possible reason is that in Ethiopia many women seek service after trying the traditional options at home (68). The delay at home reduces the chance of survival or aggravates complications.

Essential components of maternal services can be missing due to two common reasons; 1) the unavailability of facilities in the health institution and 2) the poor skills of providers. Regarding the first reason, in many of the visited facilities in this study, important pieces of equipment were either missing or nonfunctional. Most of the health centers also lacked important laboratory tests, such as VDRL, hemoglobin, urine protein and cross match. The absences of such pieces of equipment or tests have a clear effect on screening services during maternity care, most of which

are at health centers. This was a common challenge identified by other studies (124). Concerning the skills of providers, many of the interviewed midlevel providers had no adequate training on important procedures, like assisted vaginal delivery (vacuum extraction), manual vacuum aspiration or evacuation and curettage. In addition, about one-third had no skill to manage preeclampsia and post-abortion complications. Training deficiencies and skill retention problems were one of the major bottlenecks to have quality maternal care in many developing countries (5, 125-127).

In general, the findings imply that improving the quality of care and monitoring facilities capacity to perform the expected function at their level will be one of the strategies to increase the utilization rates of maternity care by skilled providers. Furthermore, though many of the studies and programs considered coverage of maternal care as utilization of maternal services, utilization is meaningful if women received important service components at the time of their maternity care.

VI. Validity and Generalizability

Evaluating the quality (validity and generalizability) of both the quantitative and qualitative components is mandatory when a mixed method research is conducted.

Internal Validity

In a quantitative research, validity (internal validity) refers to the ability to measure correctly, what is supposed to measure (getting the truth-value). It needs the evaluation of chance, bias, and confounding as alternative explanations for research findings.

In this dissertation, the role of chance was addressed by using adequate and representative samples to answer each specific objective. Its effect was also detected by the confidence intervals. In some of the categories of independent variables, small sample sizes were observed during the multivariate analysis. In such situations, re-categorizing by merging or excluding very small categories was done. Merging was also done in measuring rare outcomes (occurrences of complications and death).

Various actions, starting from questionnaire designing to data analysis, were taken to reduce the role of bias as alternative explanations for the research findings (See data quality assurance). The use of questionnaire adapted from standard data collection instruments, educated and experienced data collectors, the presence of intensive trainings, and close supervision were among the major inputs to reduce interviewer and other measurement biases. To reduce recall bias related to services and complications, women who gave birth one year preceding the survey were interviewed.

The baseline difference observed in the socio-demographic characteristics of women and other measured variables can act as confounding factors. Hence, addressing confounding was one of the major actions in this study. As a principle, there are three ways to deal with confounding during planning and designing the study, such as randomization, matching and restriction. However, applying a procedure like randomization is impractical in observational studies. Therefore, the analysis level approaches, like standardization, stratification, and multivariate analysis were our options. Since more than a few confounding variables are present, the

multivariate analysis was the focused statistical technique. As a result, different types of regression analyses were conducted. The multilevel modeling was one of the key procedures to control confounders in this dissertation. Binary logistic regression was also applied to control potential confounders when assessing associations in two of the papers.

Important procedures were also considered to produce valid results in the qualitative part of the study. Lincoln and Guba proposed four criteria to judge the “trustworthiness”, the extent to which one can believe in the qualitative research findings (128). The four criteria are “credibility”, “dependability”, “confirmability”, and “transferability”.

Like internal validity in quantitative studies, credibility focuses on the confidence in the truthfulness of the findings. It can be evaluated by different activities including prolonged engagement, persistent observation, triangulation, member checking and peer debriefing. The principal investigator and data collectors were familiar with the cultural and social backgrounds of the study participants. Different groups of participants including women (with uncomplicated and complicated childbirths), men (husbands), elders and traditional birth attendants from different kebeles were interviewed to have triangulated data. In addition, the quantitative and qualitative findings were triangulated for better understanding of the reality. During the data collection, daily discussions were conducted in order to understand what informants were saying and to identify the areas that needed probing for future interviews. Peer debriefing was done at the end of data collection and during presentation of preliminary findings through which we received substantive comments.

Dependability measures consistency of observing the same findings under similar circumstances. The replication is not necessarily of the results, but of the process used to obtain the results. Other investigators should be able to replicate the study. For possible repetition of the study, the procedures and the data collection tools used in the qualitative part of this dissertation were appended.

Confirmability focuses on the extent that the research findings can be confirmed by others (129). The tape-recorded and transcribed data were made ready for other researchers to do their own analysis. The process is “audit trail” which enables others to verify the interpretations based on the collected data.

External validity

Generalizability (external validity) refers to whether results are applicable to other populations. An analogous term, which evaluates whether findings are transferable to another context or to the same location at a future time in qualitative study, is known as “transferability”. Since the health care system organization is similar, the findings can reasonably be informative about the utilization of skilled maternal care and determinant factors in other settings of the country. Many other parts of the Amhara Regional State have similar cultural profiles, and findings can be transferable to areas with similar contexts.

VII. Strengths and Limitations

One of the major strengths of this study was the use of different methods to understand the problem. A mixed method is a pragmatic approach that helps us to focus on the problem rather than the method. Since both the quantitative and qualitative approaches have their own limitations, mixing the two has a likelihood of producing a complementary effect. It could facilitate a comprehensive understanding from multiple perspectives; produce a composite picture of the reality. Studying skilled maternal care by applying different designs, such as cross-sectional, case-control, and follow-up studies also helped to understand the details of its nature.

The second strength is that linked facility and population-based survey was applied for data collection. The use of such a survey is the best approach to analyze causality in non-experimental surveys. The strong side of such a design is that it is possible to analyze factors at different levels simultaneously. It also helped us to plan the two surveys in tandem to coordinate the fieldwork and to ensure that the two sets of the questionnaire complement each other.

Thirdly, incorporating multilevel modeling /analysis/ technique helped to answer the major research question. In hierarchical data, individual-level observations from the same upper level group will be more similar (not independent) due to factors like shared group history and group selection processes. This clustering by group increases Type I error if not taken into account. Multilevel models allow us to consider the individual level and the group level in the same analysis, rather than having to choose one or the other. The traditional linear regressions cannot handle such kinds of problems when the assumption of independence is violated. They suffer from problem of analysis at the inappropriate level (atomistic or ecological fallacy).

As a précis, this study added new knowledge in the area of maternal health service by; 1) implementing better methodological approaches (including the concept of linked survey and multilevel analysis), 2) estimating prevalence of complications and their service coverage, 3) determining the relative contributions of different levels and the specific factors within each level, and 4) evaluating the contribution of our service in achieving maternal health goals (reducing adverse pregnancy outcomes).

There were also a number of limitations throughout the process of the study. During the interview, women faced difficulties to differentiate the type of skilled providers who gave them care. To reduce the problem, data collectors gave further clarifications by collecting information on types of providers (doctor, health officer, nurse, midwife, health extension worker or others) from health institutions that gave services. Health care providers were well known by data collectors except those working at the hospital. Errors may occur in knowing the categories of health professionals, especially for the cases served at hospital. However, there were no serious difficulties in categorizing service providers as skilled or non-skilled, so it did not affect the interpretation of results. So, the potential limitations were minimized.

Judging the severity of an obstetric problem to consider it as a complication, based on a woman's self-report, can be challenging compared to a decision made after medical examinations at health care facilities. There is a possibility of under reporting of some types of complications and over reporting of others. To reduce its effect, data collectors took extensive training about when they should consider the morbidity as a complication.

During the analysis of the follow up study, the occurrence of at least one type of complication or death was considered to answer the objectives. In reality, the effect of skilled care may vary according to the specific type of complication or mortality. However, the samples by type of complication and mortality were very small to do such an analysis. Hence, the study lacks a statistical power of drawing conclusions based on specific types of complications and deaths.

Because of the nature of the study, recall and interviewer bias were also the potential limitations at the time of the cross-sectional surveys. The details of care during antenatal and delivery service may not be precisely understood or memorized by service users. However, numerous scientific procedures have been employed to minimize the possible effects. To reduce the recall bias, for instance, only women who gave birth in the last one year were included.

VIII. Conclusions

Most women did not use skilled maternal care for uncomplicated pregnancy and childbirth (the routine ANC, delivery and PNC). Nearly half of the women who faced complications also did not seek skilled maternal care (emergency care by skilled providers).

The utilization of skilled maternal care depends on separate and joint effects of individual, communal and health facility level factors. Awareness and perception on skilled provider or care, level of education, and previous maternal health experiences especially previous use of ANC, were the major individual level factors affecting skilled maternal care utilization. The top reason for not using skilled maternal care was poor awareness and perceptions related to skilled maternal care and complications. At communal and facility level, cost requirements at health facilities, having different sources of income to cover transport and service costs, and the availability of important service components at health facilities were among the factors affecting skilled maternal care other than ANC.

Although antenatal and delivery care were available in most of the visited facilities, important components of both the routine and emergency maternity care services were incomplete. The study identified that missing essential components of maternal services happened due to two major reasons, lack of facilities in the health institution and deficiencies in the skills of providers.

Providing incomplete (poor quality) maternal service had damaging effects on maternal service in many ways. Its effect on health-seeking behavior of mothers was observed. Beyond that, the follow up study showed that when important service components were missing, the goals of maternity services, reducing morbidity and mortality was not achieved. So, the available skilled maternal care showed an insignificant reduction in the adverse pregnancy outcomes (complications and deaths).

IX. Recommendations

Policy and Program Recommendations

Factors influencing maternal health services utilization operate at various levels. Therefore, level-by-level analysis of all sources of poor skilled maternal care utilization has a strategic relevance. It can provide very good idea to design and implement maternal service strategies at different levels.

Improving community awareness and perception on skilled providers and their care by targeting women who prefer non-skilled providers, illiterate women, and women who do not have any awareness is very important. Safe motherhood education using the available communication networks in rural communities (health development army) and innovative informational campaigns are useful strategies to improve the intended awareness and perceptions of women.

Having previous experience of ANC was identified as a key entry point to seek all types of skilled maternal services. As a strategy, expanding the service through outreach programs and domiciliary services using the available health care system will produce a higher coverage in all types of skilled maternal care (skilled care during pregnancy, delivery, postpartum and complication). Producing more midwives or using health extension workers with some training can create a very good opportunities for running the domiciliary or outreach programs.

The challenges related to transportation problems and cost requires sustainable solutions. Introducing a health insurance system to the rural community at least to cover transport costs is mandatory. In addition, the current government efforts to have a functional referral system through the distribution of ambulance for districts and the free maternal care policy should be continued and strengthened to ensure the continuum of care in the health care system.

Improving the quality of both the routine maternity and EmOC services (providing important service components) was identified as the most urgent intervention to achieve the goals of maternal health programs. Improving the skills of providers through in-service training, the provision of basic equipment needed for maternal care, and monitoring the health facility using the signal functions on regular bases are the major activities for vital service components.

Further Research

Studying the competence of care providers and the performance of facilities using adequate sample and length of follow up is crucial to evaluate the quality of care and its consequences. Intervention studies targeting specific types of complications are mandatory. Moreover, evaluating intervention strategies like home-based (domiciliary) service by skilled providers and expanding the strategies based such pilot studies is the future research directions.

X. Acknowledgments

I am deeply grateful to my supervisors Dr. Alemayehu Worku, Professor Mesganaw Fantahun and Professor Henry Mosley for their unreserved support, advice and encouragement throughout my PhD study. I am very grateful to Addis Ababa University for providing me the training opportunity and financial support to accomplish my PhD work. I would like to extend my heartfelt thanks to North Gondar Zonal Health Department and the District Health Office staff for their support in accessing their documents and support during the data collection preparations and processes. Finally yet importantly, I want to acknowledge the data collectors, supervisors, and all of the study subjects who participated at different stages of this study.

References

1. WHO. Monitoring Emergency Obstetric Care: A Handbook, WHO, UNICEF, UNFPA and AMDD: World Health Organization; 2009.
2. WHO. Maternal mortality in 2005: estimates developed by WHO, UNICEF, UNFPA, and the World Bank. 2007.
3. UNICEF. Guidelines for monitoring the availability and use of obstetric services New York: UNICEF; 1997. p. 103
4. Carlough M, McCall M. Skilled birth attendance: what does it mean and how can it be measured? A clinical skills assessment of maternal and child health workers in Nepal. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*. 2005;89(2):200-8.
5. Harvey SA, Ayabaca P, Bucagu M, Djibrina S, Edson WN, Gbangbade S, et al. Skilled birth attendant competence: an initial assessment in four countries, and implications for the Safe Motherhood movement. *International Journal of Gynecology & Obstetrics*. 2004;87(2):203-10.
6. WHO. Making pregnancy safer: the critical role of the skilled attendant. A joint statement by WHO, ICM, and FIGO. Geneva: . Department of Reproductive Health and Research, World Health Organization., 2004.
7. Frøen JF, Cacciatore J, McClure EM, Kuti O, Jokhio AH, Islam M, et al. Stillbirths: why they matter. *Lancet*. 2011;377(9774):1353-66.
8. Graham WJ, Ahmed S, Stanton C, Abou-Zahr CL, Campbell OMR. Measuring maternal mortality: An overview of opportunities and options for developing countries. *BMC Medicine*. 2008;6(1).
9. Ronsmans C, Graham WJ. Maternal mortality: who, when, where, and why. *Lancet*. 2006;368(9542):1189-200.
10. WHO. Trends in maternal mortality: 1990 to 2008. Estimates developed by WHO, UNICEF, UNFPA and The World Bank. Geneva: WHO; 2010.
11. Central Statistical Agency Ethiopia, ICFinternational. Ethiopia demographic and health survey 2011. Addis Ababa, Ethiopia and Calverton, Maryland, USA: 2012.
12. FMOH, Ethiopia. Health Sector Development Programme IV. Addis Ababa: MOH; 2011.
13. FMOH, Ethiopia. National reproductive health strategy: 2006 - 2015. In: Department FH, editor. Addis Ababa: Ministry of health; 2006.
14. Högberg U. The Decline in Maternal Mortality in Sweden. *American Journal of Public Health*. 2004;94(8):1312-20.
15. Lerberghe WV, Brouwere VD. Of blind alleys and things that have worked: History's lessons on reducing maternal mortality. In: Brouwere VD, Lerberghe WV, editors. *Safe motherhood strategies: a review of the evidence* UK: ITG Press; 2001. p. 1-33.
16. Filippi V, Ronsmans C, Campbell OMR, Graham WJ, Mills A, Borghi J, et al. Maternal health in poor countries: the broader context and a call for action. *Lancet*. 2006;368(9546):1535-41.

17. Campbell OMR. Measuring the Determinants of Maternal Morbidity and Mortality: Defining and Selecting Outcomes and Determinants, and Demonstrating Associations: London School of Hygiene and Tropical Medicine; 1991.
18. Midhet F, Becker S, Berendes HW. Contextual determinants of maternal mortality in rural Pakistan. *Social Science & Medicine*. 1998;46(12):1587-98.
19. Norton M. New evidence on birth spacing: promising findings for improving newborn, infant, child, and maternal health. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*. 2005;89 Suppl 1:S1-6.
20. Koblinsky MA. Beyond maternal mortality--magnitude, interrelationship, and consequences of women's health, pregnancy-related complications and nutritional status on pregnancy outcomes. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*. 1995;48 Suppl:S21-32.
21. Prata N, Sreenivas A, Vahidnia F, Potts M. Saving maternal lives in resource-poor settings: facing reality. *Health Policy*. 2009;89(2):131-48.
22. WHO | Making pregnancy safer: The critical role of the skilled attendant. [updated 2012/12/11/11:10:10]; Available from: http://www.who.int/maternal_child_adolescent/documents/9241591692/en/index.html.
23. WHO. The World Health Report 2005 - make every mother and child count. Geneva: World Health Organization, 2005 2012/10/25/14:38:25. Report No.
24. Graham WJ, Bell JS, Bullough CH. Can skilled attendance at delivery reduce maternal mortality in developing countries? . In: Brouwere VD, Lerberghe WV, editors. *Safe motherhood strategies: a review of the evidence* UK: ITG Press; 2001. p. 97-129.
25. Lawn JE, Kinney M, Lee ACC, Chopra M, Donnay F, Paul VK, et al. Reducing intrapartum-related deaths and disability: can the health system deliver? *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*. 2009;107 Suppl 1:S123-40, S40-42-S-40, S40-42.
26. McClure EM, Goldenberg RL, Bann CM. Maternal mortality, stillbirth and measures of obstetric care in developing and developed countries. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*. 2007;96(2):139-46.
27. Hounton S, Menten J, Oue'draogo M, Dubourg D, Meda N, Ronsmans C, et al. Effects of a Skilled Care Initiative on pregnancy related mortality in rural Burkina Faso. *Tropical Medicine and International Health*. 2008;13:53-60.
28. Koblinsky MA, Campbell O, Heichelheim J. Organizing delivery care: what works for safe motherhood? *Bulletin of the World Health Organization*. 1999;77(5):399-406.
29. Stephenson P. Focused antenatal care: A better, cheaper, faster, evidence based approach. *Global health technical brief: USAID*; 2006.
30. WHO. Standards for maternal and neonatal care: Provision of effective antenatal care. 2006; Available from:

http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/a91272/en/index.html.

31. Blum LS, Sharmin T, Ronsmans C. Attending Home vs. Clinic-Based Deliveries: Perspectives of Skilled Birth Attendants in Matlab, Bangladesh. *Reproductive health matters*. 2006;14(27):51-60.
32. Chowdhury ME, Botlero R, Koblinsky M, Saha SK, Dieltiens G, Ronsmans C. Determinants of reduction in maternal mortality in Matlab, Bangladesh: a 30-year cohort study. *The Lancet*. 370(9595):1320-8.
33. Islam M, Yoshida S. Women are still deprived of access to lifesaving essential and emergency obstetric care. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*. 2009;106(2):120-4.
34. Hartfield VJ. Maternal mortality in Nigeria compared with earlier international experience. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*. 1980;18(1):70-5.
35. Ahmed S, Creanga AA, Gillespie DG, Tsui AO. Economic status, education and empowerment: Implications for maternal health service utilization in developing countries. *PLoS ONE*. 2010;5(6).
36. Ethiopian, Society, of, Population, Studies. *Maternal Health Care Seeking Behaviour in Ethiopia: In-depth Analysis of the Ethiopian Demographic and Health Survey 2005*. Addis Ababa: Ethiopian Society of Population Studies, 2008.
37. Mekonnen Y, Mekonnen A. Factors influencing the use of maternal healthcare services in Ethiopia. *Journal of health, population, and nutrition*. 2003;21(4):374-82.
38. Abay T. *Assessment of utilization of skilled birth attendant at delivery in Mekelle town, Northern Ethiopia*: Addis Ababa University; 2007.
39. Fenta M. *Assessment of factors affecting utilization of maternal health care services in Ayssaita and Dubti towns, Afar Regional State, North East Ethiopia*: Addis Ababa University; 2005.
40. Dessalegn Y. *Assessment of utilization of maternal health care services and influencing factors in Dabat woreda, Northwest Ethiopia* University of Gondar; 2010.
41. Mekonen K. *Assessment of level of institutional delivery and associated factors among women who gave birth five years preceding the survey in Motta Town Administration, East Gojjam zone, Amhara regional state*: University of Gondar; 2009.
42. Seifu A. *Factors affecting the utilization of institutional delivery service among women in child bearing age in South West Shoa zone of Oromia regional state, Ethiopia*: Addis Ababa University; 2011.
43. Beker A. *Assessment of factors affecting utilization of institutional delivery among women of childbearing age in Harari Region, East Ethiopia* Addis Ababa University 2010.
44. Haile F. *Assesment of factors affecting safe delivery care service utilization in Brna Tsemay woreda, South Omo zone, SNNPR, Ethiopia* Addis Ababa University; 2010.

45. Nigussie M, Mariam DH, Mitike G. Assessment of safe delivery service utilization among women of childbearing age in North Gondar Zone, North West Ethiopia. *Ethiopian Journal of health development*. 2004;18(3):145-52.
46. Asres A. Assessment of factors associated with safe delivery service utilization among women of childbearing age in Sheka zone, SNNPR, South East Ethiopia: School of Graduate Studies Addis Ababa University; 2008.
47. Ayele B. What factors determine delivery practices of pregnant women? Comparative analysis of findings from behavioral modeling and follow up of actual practices: School of Graduate Studies, Addis Ababa University; 2005.
48. Mekonen A. Household decision making status of women in relation to maternal health care utilization in Dabat, North West Ethiopia: University of Gondar 2009.
49. Amano A, Gebeyehu A, Birhanu Z. Institutional delivery service utilization in Munisa Woreda, South East Ethiopia: a community based cross-sectional study. *BMC Pregnancy and Childbirth*. 2012;12(1).
50. Mekonnen Y. Patterns of maternity care service utilization in Southern Ethiopia: Evidence from a community and family survey. *Ethiopian Journal of health development*. 2003;17(1):27-33.
51. ICF, International, Inc. Trends in Demographic and Reproductive Health Indicators in Ethiopia Calverton, Maryland, USA: ICF International Inc, 2013.
52. Mekonnen Y, Mekonnen A. Utilization of Maternal Health Care Services in Ethiopia Calverton, Maryland, USA: ORC Macro: 2002.
53. Magadi MA, Agwanda AO, Obare FO. A comparative analysis of the use of maternal health services between teenagers and older mothers in sub-Saharan Africa: evidence from Demographic and Health Surveys (DHS). *Social science & medicine* (1982). 2007;64(6):1311-25.
54. Alemayehu T. Determinants of teenage fertility and their maternal health service utilization in Ethiopia: School of Graduate Studies, Addis Ababa University; 2008.
55. [Ethiopia] CSA, Macro O. Ethiopia Demographic and Health Survey 2005. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central statistical agency 2006.
56. Fort AL, Kothari MT, Abderrahim N. Postpartum Care: Levels and Determinants in Developing Countries. Calverton, Maryland, USA: Macro International Inc. 2006.
57. Stanton C, Blanc AK, Croft T, Choi Y. Skilled care at birth in the developing world: progress to date and strategies for expanding coverage. *Journal of biosocial science*. 2007;39(1):109-20.
58. Chandhiok N, Dhillon BS, Kambo I, Saxena NC. Determinants of antenatal care utilization in rural areas of India : A cross-sectional study from 28 districts. *The Journal of Obstetrics and Gynecology of India*. 2006;56(1):47-52.
59. Letamo G, Rakgoasi SD. Factors associated with non-use of maternal health services in Botswana. *Journal of health, population, and nutrition*. 2003;21(1):40-7.

60. WHO. Antenatal care in developing countries : promises, achievements and missed opportunities : an analysis of trends, levels and differentials, 1990-2001. World Health Organization 2003.
61. Sepehri A, Sarma S, Simpson W, Moshiri S. How important are individual, household and commune characteristics in explaining utilization of maternal health services in Vietnam? *Social science & medicine* (1982). 2008;67(6):1009-17.
62. Lubbock LA, Stephenson RB. Utilization of maternal health care services in the department of Matagalpa, Nicaragua. *Rev Panam Salud Publica*. 2008;24(2):75-84.
63. Karim A, Betemariam W, Yalew S, Alemu H, Carnell M, Mekonnen Y. Programmatic correlates of maternal healthcare seeking behaviors in Ethiopia. *Ethiopian Journal of health development*. 2010;24(1):92-9.
64. Kebede B, Gebeyehu A, Andargie G. Use of previous maternal health services has a limited role in reattendance for skilled institutional delivery: cross-sectional survey in Northwest Ethiopia. *International journal of women's health*. 2013;5:79-85.
65. Yigzaw T, Yibrie A, Kebede Y. Domestic violence around Gondar in Northwest Ethiopia. *Ethiopian Journal of Health Development* 2004;18(3):133-9.
66. Woldemicael G. Do women with higher autonomy seek more maternal and child health-care? Evidence from Ethiopia and Eritrea. Available online at <http://www.demogr.mpg.de/papers/working/wp-2007-035.pdf> 2007.
67. Biratu B, Lindstrom DP. The influence of husbands' approval on women's use of prenatal care: Results from Yirgalem and Jimma towns, south west Ethiopia. *Ethiopian Journal of Health Development* 2000;20(2):84-92.
68. Warren C. Care seeking for maternal health: challenges remain for poor women. *Ethiopian Journal of health development*. 2010;24(1).
69. USAID. Formal and informal fees for maternal health care services in five countries: policies, practices, and perspectives. Policy working paper series. 2005(16).
70. Tsui A, Ukwuani F, Guilkey D, Angeles G. A Comparative multi-level analysis of health program effects on individual use of reproductive and sexual health services. *MEASURE Evaluation Bulletin*. 2003(6):1-12.
71. Chowdhury ME, Ronsmans C, Killewo J, Anwar I, Gausia K, Das-Gupta S, et al. Equity in use of home-based or facility-based skilled obstetric care in rural Bangladesh: an observational study. *The Lancet*. 2006;367(9507):327-32.
72. Babalola S, Fatusi A. Determinants of use of maternal health services in Nigeria - looking beyond individual and household factors. *BMC Pregnancy and Childbirth* 2009;9(1):43.
73. Gage AJ. Barriers to the utilization of maternal health care in rural Mali. *Social Science & Medicine*. 2007;65(8):1666-82.
74. Prata N, Greig F, Walsh J, West A. Ability to pay for maternal health services: what will it take to meet who standards? *Health Policy*. 2004;70(2):163-74.

75. Haque N. Individual's Characteristics Affecting Maternal Health Services Utilization: Married Adolescents And Their Use Of Maternal Health Services In Bangladesh. *The Internet Journal of Health*. 2009;8(2).
76. Wirth M, Sacks E, Delamonica E, Storeygard A, Minujin A, Balk D. "Delivering" on the MDGs?: equity and maternal health in Ghana, Ethiopia and Kenya. *East Afr J Public Health*. 2008;5(3):133-41.
77. Paxton A, Bailey P, Lobis S, Fry D. Global patterns in availability of emergency obstetric care. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*. 2006;93(3):300-7.
78. Tlebere P, Jackson D, Loveday M, Matizirofa L, Mbombo N, Doherty T, et al. Community-Based Situation Analysis of Maternal and Neonatal Care in South Africa to Explore Factors that Impact Utilization of Maternal Health Services. *The Journal of Midwifery & Women's Health*. 2007;52(4):342-50.
79. Rose M, Abderrahim N, Stanton C, Helsel D. Maternity care: A comparative report on the availability and use of maternity services. MEASURE Evaluation 2001.
80. Materia E, Mehari W, Mele A, Rosmini F, Stazi MA, Damen HM, et al. A community survey on maternal and child health services utilization in rural Ethiopia. *European Journal of Epidemiology*. 1993;9(5):511-6.
81. Sutcliffe K, Caird J, Kavanagh J, Rees R, Oliver K, Dickson K, et al. Comparing midwife-led and doctor-led maternity care: a systematic review of reviews. *J Adv Nurs*. 2012;68(11):2376-86.
82. Bhutta ZA, Darmstadt GL, Haws RA, Yakoob MY, Lawn JE. Delivering interventions to reduce the global burden of stillbirths: improving service supply and community demand. *BMC Pregnancy and Childbirth*. 2009;9 Suppl 1:S7-S.
83. Haws RA, Yakoob MY, Soomro T, Menezes EV, Darmstadt GL, Bhutta ZA. Reducing stillbirths: screening and monitoring during pregnancy and labour. *BMC Pregnancy and Childbirth*. 2009;9 Suppl 1.
84. Lawn JE, Kinney M, Lee ACC, Chopra M, Donnay F, Paul VK, et al. Reducing intrapartum-related deaths and disability: can the health system deliver? *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*. 2009;107 Suppl 1:S123-40, S40-42.
85. Khan KS, Wojdyla D, Say L, Gülmezoglu AM, Van Look PFA. WHO analysis of causes of maternal death: a systematic review. *Lancet*. 2006;367(9516):1066-74.
86. Cristina Rossi A, Mullin P. The etiology of maternal mortality in developed countries: a systematic review of literature. *Archives of gynecology and obstetrics*. 2012;285(6):1499-503.
87. Bailey P, Paxton A, Lobis S, Fry D. The availability of life-saving obstetric services in developing countries: an in-depth look at the signal functions for emergency obstetric care. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*. 2006;93(3):285-91.

88. Santos C, Diante D, Baptista A, Matediane E, Bique C, Bailey P. Improving emergency obstetric care in Mozambique: The story of Sofala. *International Journal of Gynecology & Obstetrics*. 2006;94(2):190-201.
89. Akwara P, Alayón S, Barry S, Lettenmaier C, David V, Magumba G, et al. Uganda Delivery of Improved Services for Health (DISH) Facility Surveys 2002. Carolina Population Center, University of North Carolina, 2003.
90. Nigenda G, Langer A, Kuchaisit C, Romero M, Rojas G, Al-Osimy M, et al. Womens' opinions on antenatal care in developing countries: results of a study in Cuba, Thailand, Saudi Arabia and Argentina. *BMC public health*. 2003;3(1).
91. Smith KV, Sulzbach S. Community-based health insurance and access to maternal health services: evidence from three West African countries. *Social science & medicine* (1982). 2008;66(12):2460-73.
92. Molalign A. "Marriage, Family and Kinship" and "Reproduction" Available online at EthnoMed.htm In: Duncan A, Hayden M, editors. Ethiopian cultural profile EthnoMed2008.
93. Yousuf J, Ayalew M, Seid F. Maternal health beliefs, attitudes and practices among Ethiopian Afar. Exchange, on HIV/AIDS, sexuality and gender [Internet]. 2011:[12-4 pp.].
94. Shimeka A. Institutional delivery service utilization and associated factors among mothers who gave birth in the last 12 months in Sekela woreda, West Gojjam zone, Amhara regional state: University of Gondar; 2010.
95. Beyene Y. Medical disclosure and refuges: Telling bad news to Ethiopian patients. *Western Journal of Medicine*. 1992;157:328-32.
96. Kruk ME, Galea S, Prescott M, Freedman LP. Health care financing and utilization of maternal health services in developing countries. *Health Policy Plan*. 2007;22(5):303-10.
97. FMOH. Ethiopia. Annual performance report of health service development program three (HSDP-III). Addis Ababa: Federal Minstry of Health, 2007.
98. Dmytraczenko T, Rao V, Ashford. L. Health sector reform: How it affects reproductive health. . Measure policy brief. 2003.
99. Parkhurst JO, Penn-Kekana L, Blaauw D, Balabanova D, Danishevski K, Rahman SA, et al. Health systems factors influencing maternal health services: a four-country comparison. *Health Policy*. 2005;73(2):127-38.
100. USAID. Country health statistical report. Ethiopia. 2009.
101. ORC Macro, Central Statistical Agency. Ethiopia demographic and health survey 2005. Addis Ababa and Calverton: Central Statistical Agency and ORC Macro; 2006.
102. Federal Democratic Republic of Ethiopia PCCo. Statistical Report of the 2007 Population and Housing Census of Ethiopia Results. Addis Ababa: UNFPA, Population Census Commission; 2008.
103. United States Central Intelligence Agency. World fact book of the United States Central Intelligence Agency: Ethiopia economy 2011. 2011 [cited 2011 Dec 27]; Available from: http://www.theodora.com/wfbcurrent/ethiopia/ethiopia_economy.html.

104. Ethiopia. Statistical Report of the 1994 Population and Housing Census of Ethiopia. Results for Amhara Region Addis Ababa.
105. WorldBank. For Ethiopias: A Regional Characterization. Assessing Ethiopia,s growth potential and development obstacles. World Bank, 2004.
106. Tadesse T, Getachew A, Admassu M, Kebede Y, Awoke T, Melese T, et al. Demographic and health survey at Dabat district in Northwest Ethiopia: Report of the 2008 baseline survey. *Ethiop J Health and Biomed sci.* 2011;4(Special issue):1-16.
107. Hiluf M, Fantahun M. Birth Preparedness and Complication Readiness among women in Adigrat town, north Ethiopia. *Ethiopian Journal of Health Development.* 2007;22(1):14-20.
108. Turner AG, Angeles G, Tsui AO, Wilkinson M, Magnani R. Sampling Manual for Facility Surveys for Population, Maternal Health, Child Health and STD Programs in Developing Countries. Carolina Population Center, University of North Carolina at Chapel Hill: MEASURE Evaluation 2001 Contract No.: 3.
109. University of California. Annotated SPSS output: Principal components analysis. Available from: http://www.ats.ucla.edu/stat/SPSS/output/principal_components.htm. 2007.
110. University of Texas. Principal component analysis: Additional topic 2006 [cited 2011 Nov 28]; Available from: http://www.PrincipalComponentAnalysis_Outliers_Validation.
111. Neter J, Kutner M, Wasserman W, Nachtsheim C, Neter J. Applied linear regression models 4th ed. Irwin: McGraw-Hill; 2004.
112. Council for International Organizations of Medical S. International ethical guidelines for biomedical research involving human subjects. *Bull Med Ethics.* 2002(182):17-23.
113. White K, Small M, Frederic R, Joseph G, Bateau R, Kershaw T. Health seeking behavior among pregnant women in rural Haiti. *Health care for women international.* 2006;27(9):822-38.
114. Sepehri A, Sarma S, Simpson W, Moshiri S. How important are individual, household and commune characteristics in explaining utilization of maternal health services in Vietnam? *Social Science & Medicine* 2008;67:1009-17.
115. Deribe K, Biadgilign S, Amberbir A, Belachew T, Woldemichael K. The Road to Maternal Death In Rural Southwest Ethiopia. *Ethiopian Journal of Health Sciences.* 2010;20(1):71-4.
116. Killewo J, Anwar I, Bashir I, Yunus M, Chakraborty J. Perceived delay in healthcare-seeking for episodes of serious illness and its implications for safe motherhood interventions in rural Bangladesh. *Journal of health, population, and nutrition.* 2006;24(4):403-12.
117. Chakraborty N, Islam MA, Chowdhury RI, Bari W, Akhter HH. Determinants of the use of maternal health services in rural Bangladesh. *Health Promotion International.* 2003;18(4):327-37.
118. Rööst M, Altamirano VC, Liljestrand J, Essén B. Does antenatal care facilitate utilization of emergency obstetric care? A case-referent study of near-miss morbidity in Bolivia. *Acta obstetricia et gynecologica Scandinavica.* 2010;89(3):335-42.

119. WHO. Standards for Maternal and Neonatal care. Birth and emergency preparedness in antenatal care. Integrated management of pregnancy and childbirth (IMPAC). Geneva, Switzerland: Department of making pregnancy safer, WHO; 2006.
120. Bazzano AN, Kirkwood B, Tawiah-Agyemang C, Owusu-Agyei S, Adongo P. Social costs of skilled attendance at birth in rural Ghana International Journal of Gynecology and Obstetrics. 2008;102:91-4.
121. Warren C. Care seeking for maternal health: challenges remain for poor women. Ethiop J Health Dev. 2010;24 Special Issue(1):100-4.
122. Ameh C, Msuya S, Hofman J, Raven J, Mathai M, van den Broek N. Status of Emergency Obstetric Care in Six Developing Countries Five Years before the MDG Targets for Maternal and Newborn Health. PloS one. 2012;7(12).
123. Menezes EV, Yakoob MY, Soomro T, Haws RA, Darmstadt GL, Bhutta ZA. Reducing stillbirths: prevention and management of medical disorders and infections during pregnancy. BMC Pregnancy and Childbirth. 2009;9 Suppl 1.
124. Jahn A, Dar Iang M, Shah U, Diesfeld HJ. Maternity care in rural Nepal: a health service analysis. Tropical medicine & international health: TM & IH. 2000;5(9):657-65.
125. Harvey SA, Blandón YCW, McCaw-Binns A, Sandino I, Urbina L, Rodríguez C, et al. Are skilled birth attendants really skilled? A measurement method, some disturbing results and a potential way forward. Bulletin of the World Health Organization. 2007;85:783–90.
126. Darmstadt GL, Lee ACC, Cousens S, Sibley L, Bhutta ZA, Donnay F, et al. 60 Million non-facility births: who can deliver in community settings to reduce intrapartum-related deaths? International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics. 2009;107 Suppl 1:S89-112.
127. Ith P, Dawson A, Homer C. Quality of maternity care practices of skilled birth attendants in Cambodia. Int J Evid Based Healthc. 2012;10(1):60-7.
128. Lincoln Y, Guba E. Naturalistic Inquiry. Newbury Park, CA: Sage Publications, Inc; 1985.
129. Ulin PR, Robinson ET, Tolley EE. Qualitative methods in public health: A field guide for applied research 1st ed. Steckler A, editor. USA: Jossey-Bass 2005.

Annex 1: Original Papers

Paper- I

Most women do not seek maternal care for normal conditions: The experiences of rural women in North Gondar, Ethiopia

Abebaw Gebeyehu^{1,&}, Alemayehu Worku², Mesganaw Fantahun³

¹Department of Reproductive Health, Institute of Public Health, University of Gondar,

²Department of Preventive Medicine, School of Public Health, Addis Ababa University

³Department of Reproductive Health and Health Service Management, School of Public Health, Addis Ababa University

[&]Corresponding author: Abebaw Gebeyehu

E-mail address: abebawgebeyehu@yahoo.com

Tel: +251-920314519

Po Box: 196

Fax: +251-581111479

ABSTRACT

Background: In Ethiopia, the utilization of skilled maternal care services has been low. The purpose of this study was to assess the perceptions and experiences related to skilled maternal care utilization during pregnancy, delivery, and postpartum period.

Method: The study was carried out in six selected districts in North Gondar Zone, northwest, Ethiopia. The study employed a community based cross-sectional design. Both quantitative and qualitative study techniques were used. The study population comprised 1,668 randomly selected women who had births one year preceding the survey for the quantitative part. Purposively selected 36 key informants participated in the in-depth interview.

Results: All skilled maternal service utilization was highly limited in the study area. For instance, antenatal care was low (32.3%); delivery care was even lower (13.8%), and postnatal care was the least (6.3%). The main reason for not using skilled maternal care was the „not necessary if no morbidity“ belief of the participants. There was low risk perception in the community that pregnancy and childbirth were considered as normal processes. Moreover, the community prefers homebirth by traditional birth attendants or family members. The tradition does not allow a woman to leave her house in the early postpartum period, which makes it difficult for her to visit health facilities. On top of that, many respondents lack confidence in the services at health facilities and the skills of health care providers.

Conclusion: Most women do not seek services unless they have morbidity, mainly due to low perceived risk of pregnancy, cultural barriers, and perceived poor quality of services at health facilities. Community based safe motherhood education, especially on the risk of pregnancy and the benefits of skilled maternal care are necessary.

Key word: Maternal service utilization

Background

Evidences indicated that Millennium Development Goal 5 (MDG5) is the least achieved , particularly in sub-Saharan Africa [1]. Ethiopia is one of the counties with the highest maternal mortality ratio which is currently estimated at 676/100,000 live births [2].

According to global literature, good maternal health is connected with maternity care provided for the mother. The effectiveness of maternity care depends on the use of skilled providers and the presence of an appropriately resourced 24-hour obstetric facility nearby [3]. These criteria are mandatory for providing maternity care even for normal conditions during the course of pregnancy, birth, and postpartum. Women without pregnancy complications can rapidly develop such problems and may need timely access to life saving services [4].. Skilled care refers to the care provided to a woman and her newborn during pregnancy, childbirth and immediately after birth by an accredited and competent health care provider (skilled attendant) who has at her/his disposal the necessary equipment and the support of a functioning health system, including transport and referral facilities for emergency obstetric care [5]. A skilled attendant is an accredited health professional, such as a midwife, doctor or nurse who has been educated and trained to proficiency in the skills needed to manage normal pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns [5]. Historical evidence indicated that, in the 19th century, maternal mortality halved in Sweden because of a national policy favoring professional midwifery care for all births, most of which took place at home. In Denmark, Japan, the Netherlands, and Norway similar strategies of maternity care produced comparable results [6, 7]. Malaysia, Sri Lanka, and Thailand halved their maternal mortality ratios within 10 years by increasing the number of midwives in the 1950s and 1960s [7]. Based on repeated reviews of evidence, different researchers consider the scale up of skilled maternity care as an important strategy for improving maternal survival [8-10]. Since complications are unpredicted, “ensuring skilled care for all women during pregnancy, childbirth and the immediate postnatal period” is one of the strategies to reduce maternal and newborn mortalities recommended by the World Health Organization [5]. In Ethiopia, skilled maternal service utilization is extremely low. The recent 2011 Ethiopian Demographic and Health Survey report showed that only 34%, 10% , and 6% of the women, respectively, had ANC, delivery, and postnatal care by skilled providers[2].

The question “Why is skilled maternal care utilization very low in Ethiopia?” is a puzzle that needs an appropriate answer by analyzing all potential reasons. Most demographic and socio-economic determinants have been addressed in many studies. In contrast, the beliefs and perceptions of women about the care and risks of pregnancy and childbirth, though important, have not been focused on. Thus, this study was planned to assess women’s perceptions and experiences related to skilled maternal care utilization during pregnancy, delivery, and the post partum period.

METHODS

The study was conducted over three months (January - March 2012) in North Gondar Zone, which is one of the 11 zones of the Amhara Region, northwest Ethiopia. A cross-sectional community based study using a mix of quantitative and qualitative methods was carried out. The quantitative part involved a structured questionnaire survey for generalizing findings, whereas the qualitative part attempted to explore more about why women were not using health facilities. In-depth interviews were employed primarily for the qualitative study.

The participants of quantitative study were women who had births in the year that immediately preceded the survey. Multistage sampling procedure was applied to select eligible women. Initially six districts (Dembia, Lay Armachiho, West Belessa, Metema, Debark and Dabat) were randomly selected from the total 22 districts in the zone. Then 12 kebeles (2 kebeles from each district) were selected randomly. Finally, all eligible women in the clusters (kebeles) were included in the study. Based on the single population proportion formula, the sample size was calculated with assumptions of 95% confidence level, marginal error of 2, and a design effect of 3. Of the six alternative sample sizes computed based on different indicators, the largest sample (1550 women), calculated based on delivery care by a health professional (5.7%) was taken. For the qualitative part, different categories of participants from all districts were selected in order to triangulate the findings by data source and site. Accordingly, 12 women (maternal service users and non-users) together with their husbands, 12 elders (6 male and 6 female) and 12 traditional birth attendants were identified purposively.

The quantitative survey questionnaire included questions relating to socio-demographic characteristics, antenatal, delivery and postnatal care services. The instrument prepared in

Amharic was pre-tested ahead of time. The minimum qualification of data collectors was higher education in diploma while supervisors were at least degree graduates. In each of the 12 kebeles selected, two data collectors and one supervisor were trained and deployed for the quantitative survey.

For the qualitative part, separate in-depth interview guides were prepared for women, men (husbands), elders, and traditional birth attendants. The in-depth interview guides consisted of multifaceted open-ended questions covering a range of issues about experiences, perceptions and barriers relating to skilled maternal care during pregnancy, delivery and postpartum period. Three master's degree graduate Gondar University staff members conducted the in-depth interview using a voice recorder. The interviewers used probing and question-rephrasing techniques to clarify questions and obtain details from the respondents. Interviews were conducted until a saturation point was reached where no new information or insight into women's health-seeking behaviors and perceptions was obtained. On the whole, 36 in-depth interviews were conducted.

The quantitative and qualitative findings were analyzed separately. In the quantitative part, data cleaning was performed initially to check for accuracy, consistency, missed values, and variables. Data entry was done using Epi Info version 3.5.3; then, it was exported to SPSS for analysis. Descriptive statistics using tables and graphs was used to describe the study population. To see the accuracy of the estimates, 95% CI was constructed for each proportion.

For the qualitative data, all tape-recorded notes were transcribed into the English text format. Subsequently, they were analyzed using the thematic content analysis technique. Using open code software, conceptual codes that evolved from the text were applied throughout the texts. Then emerging themes and categories were identified.

Finally, the quantitative and qualitative data were triangulated at conclusion to improve the validity and to complement the quantitative findings.

Before the commencement of the study, ethical clearance was obtained from the institutional review board of the College of Health Sciences, Addis Ababa University. During data collection, all study subjects were asked for consent and signed written agreements (consent forms). To

ensure confidentiality, names were not used in depicting the results of the study. In addition, the collected information, hard and soft copies, were carefully locked.

RESULTS

Socio-demographic characteristics of the study population

For the quantitative study, 1668 women were included. About 92.7% of the women were currently married. The majority (73.3%) was between 20-34 years old and when they gave birth. The mean ($\pm$ SD) age was 28.2 ($\pm$ 6.6) years, with a range of 16-51 years. The majority of the interviewed mothers (71%) and their husbands (63.4%) had no formal education (Table 1).

Antenatal care utilization

Thirty-two percent (95% CI, 30.0% to 34.5%) of the participants received antenatal care from a skilled provider, that is, from a doctor, health officer, and nurse/midwife for their most recent births. Health extension workers were involved for 4% of the mothers at all visits. About 2.6% of the mothers did not know their providers in all of their visits (Table 2).

Among mothers who reported ANC visits during their pregnancy, only 36% made their first ANC booking before the fourth month of pregnancy. The average time to start ANC was very late (out of the first trimester) with a mean of 17.7 weeks; 95% CI: 17.2, 18.3, weeks and SD of 6.7. The median and average time of last ANC visits was 32 weeks. About 16.6%; 95% CI, 14.8% to 18.4%, of the women made four or more ANC visits during their pregnancy (Table 3).

Delivery care utilization

Overall, 14.1%; 95% CI: 12.5%, 15.8%, of the births were delivered at a health facility one year preceding the survey. Two hundred thirty-one (13.8%; 95% CI, 12.2%, 15.5%) of the births were assisted by a skilled provider; 2.1% by a doctor, 1.4% by a health officer and 10.4% by a nurse or midwife. Non-skilled providers attended many (86.2%) of the births. Of these, 40 (2.4%) were assisted by health extension workers, 54.3% by traditional birth attendants, and 29.1% by a relative, or some other person (Table 4).

Postnatal care utilization

Only 163 (9.8%; 95% CI, 8.3%, 11.2%) of the mothers had postnatal checkup. Out of mothers who reported postnatal checkups, only two-thirds (6.3%; 95% CI: 5.1, 7.5%) were checked by skilled providers. Health extension workers checked 3.4% of the mothers (Table 5). This study identified that only 10.6% and 17.8% of the PNC service users had checkups within two days and in the first week of their postpartum period, respectively. The majority (three-fourths) of the PNC visits were after six days.

Reasons for not using maternal services

Women listed their reasons for not using maternal services spontaneously. About 84%, 56.5%, and 90.4% of non-users of ANC, delivery care and PNC, respectively, did not consider skilled care necessary for healthy (uncomplicated) pregnancy and childbirth. Lack of time for visiting health facilities was the second major reason for nonuse in all categories of maternal service. It was, especially important for not using delivery service, which was mentioned by 42.3% of nonusers. The use of home-based options, families' considerations about the importance of the service, lack of money, and transport difficulties were the other reasons listed by the respondents for not utilizing services (Table 6).

Findings from the in-depth interviews

From the in-depth interview, five important themes were identified for the questions „why home birth?“ and „why no skilled maternal service?“

1. Low perceived risk of pregnancy

Different categories of informants were asked about the risk of pregnancy and the need for maternity services during pregnancy, delivery, and postpartum period. There is low perceived risk of pregnancy in the community, which affects women's health seeking behavior. Pregnancy and childbirth is assumed normal phenomenon. The most frequent responses were;

“Pregnancy and child birth is natural. It is God's will to have or have no child and God makes this normal. If there is some problem, it will be due to evils that are aroused because of one's own sin. Otherwise pregnancy or child birth has no risk by itself,” elderly men from Saljichillo kebele said.

Almost all respondents believe that it is not mandatory to visit health facilities without morbidity. Most of the response to the questions related to the importance of visiting health

facilities during normal pregnancy, delivery, and postpartum period was *“If there is no problem why should women visit health facilities?”* That means it is not necessary to go to health facilities or seek skilled health professionals if the pregnancy and childbirth is normal.

2. Home birth considered as a norm

Many women consider home birth as the tradition of the community. It is the appropriate and acceptable place for childbirth and performing social ceremonies (rituals) believed to be important for the health of the mother and the newborn.

“Home birth is our tradition. I want to give birth at home, if it is normal delivery. The mother and her baby can be protected from unexpected evils „tdalafi” through our traditional interventions,” said a TBA from Darnagawrna kebele. Similar quotes were recorded from mothers and husbands.

I believe home is the best place to the mother and her baby. The family members and neighbors who can give support are nearby. The priests can pray and use holy water easily. And the mother will not be exposed to evils, in Amharic, Tselay senay or telalalfi,” elderly women from Ayquachakir kebele, representing for many others stated.

Women are not allowed to leave their home in the early postpartum period, especially, in the first 10 days. In addition, postnatal service is unlikely if there is no severe morbidity.

“The women should never be left alone in the first 10 days whether poor or rich. The family members must look after the mother in her early postpartum period and never be negligent all times. This is the riskiest period for the mother. Many kinds of evils can attack if she is not watched over carefully. We don’t allow our wives to go anywhere in the first 10 days of post partum period, including health facilities if no complications,” a husband from Darnagawrna kebele said. Similar quotes were recorded from elder women and TBAs.

3. Negative perception towards health facility services

Bad experiences and unwelcome attitude towards health facilities hinder the use of maternal care services. Many of the informants reflected their experience at health facilities. Some lack of confidence on health facilities since they are not function according to their expectations.

“A health center has been built in our kebele. Nevertheless, it is not helping us. The health center is not functioning according to our expectation. Why it is built here if it does not help us? The health center has no sufficient number of health workers and materials,” said a husband

from Chira-Anbezo kebele. Similar responses were recorded from Ayquachakir and Gond-Ebrareg Kebeles.

Other frequent responses by key informants were “fear of episiotomies and exposing genital organs.” Many women dislike having episiotomy, which they call it „operation“. They believe that it is a damaging procedure for them. They also complained about the poor privacy (exposing genital organs) of health centers.

“I am not interested in delivering at a health center. If we give birth at a health center, we will have operations. Additionally, the health center staff do not protect our privacy,” complained women from Darnagawrna kebele. TBAs and elderly women provided similar responses.

4. Negative perception towards maternal care providers

Many informants perceived that health care providers have poor skill for delivery service compared to TBAs. Some reflected their confidence in TBAs than health care providers. TBAs are within the culture of the community and are suitable to their tradition. They have the capacity to handle problems, which are sensitive in the community.

Our TBA is by far better than the health extension workers (HEWs) and nurses. She knows when there is a complication, but the HEWs and nurses do not. We know many mothers who were referred to hospitals by health center nurses but delivered normally by the TBA. We use the health post for vaccination and family planning,” a husband from Gond-Ebrareg Kebele stated.

“I had training before. I have assisted seven births this month. I give delivery service in my house for those women coming from outside this village, whereas I provide the service house to house for those living in this village. I use plastic sheets to conduct delivery in my compound in front of my house. I advise my clients to bring clean clothes to wrap the baby. I always use blade to cut the cord. I use hot water to wash the plastic sheet. Some women come back from the health center to me if their labor is prolonged. Many of the mothers do not pay but some pay up to Birr 50. Many women prefer us because of our handling technique. We never expose them and we are sensitive to the culture,” TTBA from Gond-Ebrareg and Dequana kebeles, in the same district, reflected their experiences.

The respondents reported negative reflections on carrying attitudes of health center staff. Some key informants mentioned the names and actions of such staff members.

“Health workers are not available even at working times. Some of them have no interest to give care. The previous health assistants were good, but nowadays the assigned health care workers

have no interest to help us. When I was in emergency at night, the assigned nurse (name mentioned) was not willing to come and help me. I say “shame on this nurse!” God should avoid such conditions; otherwise, I don’t have confidence in the health care providers,” a mother from Ayquachakir kebele said.

5. Transportation difficulty and cost

The respondents emphasized the problem of transportation during childbirth and emergency conditions resulting from the sudden onset of labor and lack of readiness.

“When we want to take our wives to health facilities, the transportation is very difficult, especially during rainy seasons and at night. We use „Karza” (stretcher) for transportation up to the main road. Then we find a car, always expensive, to reach Gondar Hospital. We need to borrow at least 1000 birr to cover the car fare,” a husband from Kino kebele said. Respondents from kebeles in Armachiho, Dembia, Belessa, and Dabat districts also mentioned such transport problems.

“As you know onset of labor is sudden, usually at night. How can we go long distance and deliver at health facilities? For me this is difficult,” said mother from Saljichilo kebele.

DISCUSSION

This community-based study highlights the utilization of skilled maternal care services and the major contextual barriers from the users’ side. The three indicators, ANC (32.3%), delivery care (13.8%) and PNC (6.3%) showed very poor skilled maternal care service utilizations in the area. The major reasons for poor health seeking behavior of mothers were identified through the quantitative survey and were supplemented by the in-depth interviews.

Antenatal care is one of the interventions in preventing adverse pregnancy outcomes and reducing maternal deaths. It is more beneficial when received early in pregnancy and continued until delivery. The World Health Organization recommends that all pregnant women should have at least four antenatal care assessments by or under the supervision of a skilled attendant. These should, at least, include all the interventions outlined in the new WHO antenatal care model and be given at regular intervals throughout pregnancy, commencing as early as possible in the first trimester [11]. However, this study revealed that the use of ANC service was low. Its frequency

and timing were also not according to the standards. Only 17% of the mothers had four and above ANC visits. ANC booking was late where only 36% of the ANC users made their first visit before the fourth month of pregnancy. This may be because women are usually reluctant to talk about their pregnancy which they usually know late and ANC in the early months is not common. Moreover, the median and average time for last ANC visits was 32 weeks, which indicates no service use in the later gestational ages.

Skilled attendance at the time of delivery is another key intervention for maternal survival. Since complications are not predicted, it is recommended to involve skilled attendants in all deliveries, normal or complicated. In this study, the majority of the births (86%) occurred at home and was attended by TBAs and relatives. Skilled providers attended only 13.8% of the mothers. This finding is in line with most studies conducted in Ethiopia [2, 12].

Postnatal evaluation by skilled providers is extremely important in the early post partum period since most maternal deaths happen in this period, especially in the first and second days after birth [13]. However, this study revealed that very small number of mothers (6.3%) had postnatal care by a skilled attendant. Among the PNC service users, only 10.6% had PNC visits within two days, and about three-fourths had after six days of delivery. This finding is consistent with the Ethiopian DHS reports [2, 14, 15].

Women were asked to list reasons for not using maternal services spontaneously. The unprompted responses indicated that of all types of services (ANC, delivery and PNC), the top listed reason for not using was “not considering the service necessary for healthy mothers”. This was further validated by the qualitative findings. The in-depth interview indicated that there was a low perceived risk of pregnancy in the community, and women were not ready for possible complications. Pregnancy and childbirth are assumed normal phenomena, and there is a belief that not mandatory to visit health facilities unless there is any morbidity. The most frequent response was *“If there is no problem why should women visit health facilities?”* Home birth is also considered as a norm. For mothers, the home is the appropriate and acceptable place for childbirth to perform social ceremonies and rituals believed to be important for the health of the mother and the newborn. The safe motherhood survey also showed that even for complications, pregnant women only sought care if local or herbal remedies and prayer were defeated [16]. The cultural and social values of homebirth were also observed in other sub-Saharan countries. In

rural Ghana, women preferred home birth because seeking skilled attendance at delivery had several social costs, while homebirth increased social status of the woman [17].

The second top reason listed in the quantitative survey was „no time to visit health facilities“. This was a more important reason for not seeking delivery services. Due to its sudden onset, delivery care requires health facilities nearby. If health facilities are far away, transportation difficulties, associated costs (listed in the quantitative part and identified during the in-depth interview) are significant barriers to delivery services and ANC in the late gestational ages.

Another striking explanation for not using service in the postpartum period was associated with the culture of keeping mothers at home. The culture does not allow women to leave their houses in the early postpartum period, justified on the ground that they are vulnerable to malevolent spirits. Based on this reason, seeking postnatal service in the early postnatal period is unlikely for mothers without complications.

Women`s perceptions towards the services of health facilities and providers indicated that bad experiences and unwelcome attitude about health facilities or providers hindered the use of maternal care services. Lack of confidence in health facilities and health care providers were observed during the interviews. Women also complained about the poor privacy (exposing genital organs) and fear of episiotomies. They feel that episiotomy, which they call „operation“, is a damaging procedure for them.

One of the interesting findings was preferences for TBAs by the community. Many informants perceive health care providers have bad caring attitude and have poor skill for delivery service compared to TBAs. This will be a strategic challenge for expanding skilled maternal service in the country. It is known that TBAs are culturally appropriate (trusted), highly accessible and affordable members of the community. However, there is a limited evidence about TBAs success in reducing maternal mortality, even after training [18, 19]. The assigned health extension workers and nurses may also lack the necessary skills for maternal services. Nevertheless, this requires further investigation.

Because of the nature of the study, cross-sectional design, recall and interviewer bias were potential limitations. However, numerous scientific procedures have been employed to minimize the possible effects. To reduce the recall bias, for instance, only women who gave birth in the

last one year were selected. Women also faced difficulties to differentiate the type of skilled providers during the interview. To reduce the problem, data collectors did further clarifications by collecting information on the type of providers from health institutions that gave the services.

CONCLUSION

Indicators of all skilled maternal care service utilization were very low in the study area. In the community, pregnancy and childbirth are considered as a normal process; hence, the community does not recognize the visible benefits of skilled care so long as there is no morbidity. The social and cultural values of homebirth, the culture of keeping mothers at home, preference for TBAs, lack of confidence in health facility services, and the absence of nearby health facilities and associated transport difficulties were the other identified reasons.

Community based safe motherhood education, especially on the risk of pregnancy and the benefits of skilled maternal care, is very important to tackle the identified barriers.

Acknowledgements

We are very grateful to Addis Ababa University for the approval of the ethical clearance and its technical and financial support. We would like to extend our heartfelt thanks to Professor Henry Mosley for his valuable comments starting from proposal development to the final manuscript preparation. We would also like to thank all of the study subjects who participated in this study for their commitment in responding to our interviews.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

All authors contributed equally during the process of proposal development. AG and AW participated in data collection and analysis. AG prepared the draft. Then AW and MF revised drafts of the paper. All authors read and approved the final manuscript.

List of tables

Table 1: Frequency and percentage distribution of respondents according to selected socio-demographic characteristics, North Gondar, 2012

Table 2: Antenatal care visits of mothers in their most recent (last) pregnancy according to type of providers, North Gondar 2012.

Table 3: Frequency of ANC visits throughout their most recent pregnancy among mothers who gave birth one year preceding the survey, North Gondar, 2012

Table 4: Number and percentage of mothers by type of birth attendants and delivery place, North Gondar, 2012 (n (%))

Table 5: Type of provider at the first PNC visit among women who gave birth within one year preceding the survey, North Gondar 2012

Table 6: Major reasons for not using skilled maternal care based on unprompted responses of mothers who did not use services, North Gondar, 2012

REFERENCES

1. UN: **The Millennium Development Goals Report 2011**:28 -35.
2. CSAEthiopia, ICFInternational: **Ethiopia demographic and health survey 2011**. In. Addis Ababa, Ethiopia and Calverton, Maryland, USA; 2012.
3. MacDonagh S: **Achieving skilled attendance for all; a synthesis of current knowledge and recommended actions for scaling up**. In. London: DFID Health Resource Centre; 2005.
4. Ann C: **Review of global literature on maternal health interventions and outcomes related to skilled birth attendance**. In: *KIT Working Papers Series H3*. Amsterdam: KIT; 2009.
5. WHO | **Making pregnancy safer: The critical role of the skilled attendant** [http://www.who.int/maternal_child_adolescent/documents/9241591692/en/index.html]
6. Högberg U: **The Decline in Maternal Mortality in Sweden**. *American Journal of Public Health* 2004, **94**(8):1312-1320.
7. Lerberghe WV, Brouwere VD: **Of blind alleys and things that have worked: History's lessons on reducing maternal mortality**. In: *Safe motherhood strategies: a review of the evidence* Edited by Brouwere VD, Lerberghe WV, vol. 17. UK: ITG Press; 2001: 1-33.
8. Campbell OMR, Graham WJ: **Strategies for reducing maternal mortality: getting on with what works**. *Lancet* 2006, **368**(9543):1284-1299.
9. Graham WJ, Bell JS, Bullough CH: **Can skilled attendance at delivery reduce maternal mortality in developing countries?** . In: *Safe motherhood strategies: a review of the evidence* Edited by Brouwere VD, Lerberghe WV, vol. 17. UK: ITG Press; 2001: 97-129.
10. Koblinsky M, Matthews Z, Hussein J, Mavalankar D, Mridha MK, Anwar I, Achadi E, Adjei S, Padmanabhan P, Marchal B *et al*: **Going to scale with professional skilled care**. *Lancet* 2006, **368**(9544):1377-1386.
11. **Standards for maternal and neonatal care:Provision of effective antenatal care** [http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/a91272/en/index.html]
12. Nigussie M, Mariam DH, Mitike G: **Assessment of safe delivery service utilization among women of childbearing age in North Gondar Zone, North West Ethiopia**. *Ethiopian Journal of health development* 2004, **18**(3):145-152.
13. Ronsmans C, Graham WJ: **Maternal mortality: who, when, where, and why**. *Lancet* 2006, **368**(9542):1189-1200.
14. Mekonnen Y, Mekonnen A: **Utilization of Maternal Health Care Services in Ethiopia**. Calverton, Maryland, USA: ORC Macro; 2002.
15. Ethiopian, Society, of, Population, Studies: **Maternal Health Care Seeking Behaviour in Ethiopia: In-depth Analysis of the Ethiopian Demographic and Health Survey 2005**. In. Addis Ababa; 2008.
16. Warren C: **Care seeking for maternal health: challenges remain for poor women**. *Ethiopian Journal of health development* 2010, **24**(1).
17. Bazzano AN, Kirkwood B, Tawiah-Agyemang C, Owusu-Agyei S, Adongo P: **Social costs of skilled attendance at birth in rural Ghana** *International Journal of Gynecology and Obstetrics* 2008, **102**:91-94.
18. Wilson A, Gallos ID, Plana N, Lissauer D, Khan KS, Zamora J, MacArthur C, Coomarasamy A: **Effectiveness of strategies incorporating training and support of traditional birth attendants on perinatal and maternal mortality: meta-analysis**. *BMJ* 2011, **343**(dec01 1):d7102-d7102-d7102-d7102.

19. Sibley L, Sipe TA: **What can a meta-analysis tell us about traditional birth attendant training and pregnancy outcomes?** . *Midwifery* 2004, **20**(51-60).

Table 1: Frequency and percentage distribution of respondents according to selected socio-demographic characteristics, North Gondar, 2012

Characteristics	n	%
Residence (District)	Dabat	293
	Debark	244
	Dembia	294
	L.Armachiho	228
	Metema	306
	W.Belessa	303
	Total	1668
Religion	Orthodox	1546
	Muslim	104
	Total	1650
Ethnicity	Amhara	1536
	Qimant	78
	Tigrawi	43
	Total	1657
Marital status	Single	77
	Married	1537
	Divorced	37
	Widowed	7
	Total	1658
Birth order	1	335
	2-3	657
	4-5	439
	6+	237
	Total	1668
Mather's education	No education	1183
	Primary	327
	Secondary	138
	>Secondary	20
	Total	1668
Husband's education	No education	1057
	Primary	430
	Secondary	154
	>Secondary	27
	Total	1668

Table 2: Antenatal care visits of mothers in their most recent (last) pregnancy according to type of providers, North Gondar 2012.

		ANC visits for the most recent pregnancy by taking most skilled provider involved at least once in all visits (n=1668)		
Type of provider			95% CI (%)	
		n (%)	Lower	Upper
Skilled	Doctor	23 (1.4)	0.8	1.9
	Health officer	22 (1.3)	0.8	1.9
	Midwife/Nurse	493 (29.6)	27.4	31.7
	Total	538 (32.3)	30.0	34.5
Non-skilled	Health extension worker	65 (3.9)	2.96	4.8
Have ANC visit but provider not known		43 (2.6)	1.8	3.3
Have no ANC		61.3	58.9	63.6

Table 3: Frequency of ANC visits throughout their most recent pregnancy among mothers who gave birth one year preceding the survey, North Gondar, 2012

Number and percentage of visits (n=1668)			
ANC Visits	n (%)	95% CI (%)	
		Lower	Upper
Only one	28 (1.7)	1.0	2.3
2-3	318 (19.1)	17.2	20.1
4 and above	277 (16.6)	14.8	18.4
Missing	23 (1.4)	0.8	1.9
Total (ANC users)	646 (38.7)	36.4	41.1
No ANC visit	1022 (61.3)	58.9	63.6

Table 4: Number and percentage of mothers by type of birth attendants and delivery place, North Gondar, 2012 (n (%))

Type of birth attendant		Delivery place		
		Health facility	*Home	Total
Skilled	Doctor	35 (14.8)		35 (2.1)
	Health officer	23 (9.8)		23 (1.4)
	Midwife/Nurse	171 (72.5)	2 (0.1)	173 (10.4)
	Sub total	229 (97)	2 (0.1)	231(13.8)
Non-skilled	HEWs	7 (3.0)	33 (2.3)	40 (2.4)
	TBA		905 (63.2)	905 (54.3)
	Relatives		486 (33.9)	486 (29.1)
	Alone		6 (0.4)	6 (0.4)
	Sub total	7 (3.0)	1430 (99.9)	1437 (86.2)
Total (overall)		236 (100)	1432 (100)	1668 (100)

*Home = Mothers who gave birth on the road are included under home birth

Table 5: Type of provider at the first PNC visit among women who gave birth within one year preceding the survey, North Gondar 2012

		PNC use (n=1668)		
			95% CI (%)	
Type of providers		n (%)	Lower	Upper
PNC by Skilled providers	Doctor	2 (0.1)		
	Health officer	4 (0.2)		
	Midwife/Nurse	90 (5.4)		
	Unclassified skilled provider	9 (0.5)		
	Sub total	105 (6.3)	5.1	7.5
PNC by	HEW	56 (3.4)		
Non-skilled providers	TBA	1 (0.1)		
	Families/friends	1 (0.1)		
	Sub total	58 (3.5)	2.6	4.4
No PNC		1505 (90.2)	88.8	91.7

Table 6: Major reasons for not using skilled maternal care based on unprompted responses of mothers who did not use services, North Gondar, 2012

Top listed reasons for not using maternal services	% for ANC (Number of valid cases=556)	% for Delivery care (Number of valid cases=984)	% for PNC (Number of valid cases=933)
Respondent didn't think necessary	84.0	56.5	90.4
No time to go	28.4	42.3	27.3
Used home remedy	17.8	25.4	21.8
Husband/family didn't think necessary	16.5	15.7	19.4
No money	20.5	14.9	16.5
Facility too far	14.0	14.7	14.7
No transport	13.3	14.7	12.6
Didn't know where to go	13.1	11.5	13.2
Too expensive	12.1	10.4	12.6
Services are poor	10.1	10.2	10.1

Paper- II

Maternal Complications and Women's Behavior in Seeking Care from Skilled Providers in North Gondar, Ethiopia

Abebaw Gebeyehu Worku^{1*}, Alemayehu Worku Yalew², Mesganaw Fantahun Afework³

1 Department of Reproductive Health, Institute of Public Health, University of Gondar, Gondar, Ethiopia, **2** Department of Preventive Medicine, School of Public Health, Addis Ababa University, Addis Ababa, Ethiopia, **3** Department of Reproductive Health and Health Service Management, School of Public Health, Addis Ababa University, Addis Ababa, Ethiopia

Abstract

Background: Maternal complications are morbidities suffered during pregnancy through the postpartum period of 42 days. In Ethiopia, little is known about women's experience of complications and their care-seeking behavior. This study attempted to assess experiences related to obstetric complication and seeking assistance from a skilled provider among women who gave birth in the last 12 months preceding the study.

Methods: This study was a cross-sectional survey of women who gave birth within one year preceding the study regardless of their delivery place. The study was carried out in six selected districts in North Gondar Zone, Amhara Region. Data was collected house-to-house in 12 selected clusters (kebeles) using a pretested Amharic questionnaire. During the survey, 1,668 women were interviewed. Data entry was done using Epi Info version 3.5.3 and was exported to SPSS for analysis. Logistic regression was applied to control confounders.

Results: Out of the total sample, 476 women (28.5%, 95% CI: 26.4%, 30.7%) reported some kind of complication. The most common complications reported were; excessive bleeding and prolonged labor that occurred mostly at the time of delivery and postpartum period. Out of the total women who faced complications, 248 (52.1%, 95% CI: 47.6%, 56.6%) sought assistance from a skilled provider. Inability to judge the severity of morbidities, distance/transport problems, lack of money/cost considerations and use of traditional options at home were the major reasons for not seeking care from skilled providers. Belonging to a wealthier quintile, getting antenatal care from a skilled provider and agreement of a woman in planning for possible complications were significantly associated with seeking assistance from a skilled provider.

Conclusion: Nearly half of the women who faced complications did not use skilled providers at the time of obstetric complications. Cognitive, geographic, economic and cultural barriers were involved in not using skilled maternal care.

Citation: Worku AG, Yalew AW, Afework MF (2013) Maternal Complications and Women's Behavior in Seeking Care from Skilled Providers in North Gondar, Ethiopia. PLoS ONE 8(3): e60171. doi:10.1371/journal.pone.0060171

Editor: John G. Meara, Boston Children's Hospital, United States of America

Received: September 19, 2012; **Accepted:** February 24, 2013; **Published:** March 28, 2013

Copyright: © 2013 Worku et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Funding: This is one part of a PhD study project funded by Addis Ababa University. The university is following whether findings are presented and published. The preliminary findings of this study were presented at school of public health (AAU University). After incorporating important comments, the authors have prepared this part for publication at PLOS ONE. Therefore all the presentation and publication process is the responsibility of the investigators. The funder had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Competing Interests: The authors have declared that no competing interests exist.

* E-mail: abebawgebeyehu@yahoo.com

Introduction

Many mothers living in developing countries continue to die from pregnancy related morbidities each year [1,2]. Assessments of progress towards the Millennium Development Goals (MDGs) have found that the least progress is made in MDG 5 (reducing maternal mortality by three-fourth), particularly in Sub-Saharan Africa [3,4]. Ethiopia is one of the countries with the highest maternal mortality ratio which is currently estimated at 676 maternal deaths per 100,000 live births [5]. Maternal deaths are the tip of the iceberg. For every maternal death, about 20 more women are estimated to suffer from acute or chronic pregnancy related illnesses [6]. Worldwide, an estimated 10–20 million

women develop physical or mental disabilities every year as a result of complications or their poor management [6].

Maternal morbidities include all illnesses and complications associated with child bearing short of death. Maternal morbidity takes many forms. It can be an acute or a chronic condition, which is either recognized or acknowledged as an illness or is not apparent to the respondent. The seriousness of a specific morbidity also varies; some are instantaneously lethal, while others are potentially lethal, disabling, or simply discomforting. Morbidity events may be single episodes which resolve spontaneously, are treated, or have permanent incurable effects, while others may recur occasionally or frequently [7]. Acute maternal morbidities are complications suffered during pregnancy through the postpartum period of 42 days that may directly cause maternal deaths

[8]. These can be expressed in different terms according to their severity. Obstetric or maternal complications are acute conditions which include antepartum or postpartum hemorrhage, prolonged or obstructed labor, postpartum sepsis, complications of abortion, pre-eclampsia/eclampsia, ectopic pregnancy, and ruptured uterus [9]. Overall an estimated 15% of women are expected to experience maternal complications [10]. Women without pregnancy complications can also rapidly develop such problems and may need timely access to life saving services [11]. As observed in many studies, severe maternal complications will have potentially devastating consequences on women and their families, and recovery can be slow, with lasting sequelae [12,13].

Since the majority of the complications are unpredictable, an appropriate use of skilled birth attendance and supportive emergency obstetric care are critical interventions for the survival of the mother. Maternal death can shortly follow if there are no such services. The estimated average interval between the onset of major obstetric complications and death, in the absence of medical interventions, is two hours for postpartum hemorrhage, twelve hours for antepartum hemorrhage, one day for a ruptured uterus, two days for eclampsia, three days for prolonged labor and six days for infection (puerperal sepsis) [10].

In Ethiopia, skilled maternal service utilization is very low. The recent (2011) Ethiopian demographic and health survey report showed that only 34%, 10% and 6% of women have Antenatal care (ANC), delivery and postnatal care by a skilled provider, respectively [5]. This indicated that many mothers with complications did not get a timely referral to emergency obstetric care facilities. However, there are limited evidences related to the proportion of women affected by maternal complications and seek care for the problems. Moreover, detailed evidences related to the reasons for not seeking care at the time of complication were lacking in the study area. This study focused on understanding such reasons based on women's perceptions and beliefs towards the risks as well as their experiences on obstetric complications and care-seeking behavior, which are imperative for planning appropriate interventions. Accordingly, the purpose of this study was to assess women's experiences of obstetric complications and their behavior in seeking assistance from skilled providers among women who gave birth in the last 12 months prior to the study in North Gondar, Ethiopia.

Methods

This study was a cross-sectional survey of women (age of 15 years and above) who gave birth within one year preceding the study regardless of their delivery place. The study was conducted over three months period (January–March 2012) in six districts of North Gondar Zone, Amhara Region. Gondar is located 740 kilometer northwest of Addis Ababa. At the time of the study, there were over three million inhabitants in North Gondar Zone, about 84.1% of which were rural dwellers. In the zone, there is only one referral hospital with a comprehensive emergency obstetric care. There are also about a hundred health centers and two rural hospitals. However, only the two rural hospitals and a few health centers fulfill signal functions for basic emergency obstetric care services. At the time of complications, clients need to travel long distances to get functional emergency obstetric facilities. North Gondar, which is the largest zone of the region, has a difficult topography. It is essential to understand the difficulties faced in seeking health care, especially at the time of obstetric complications in this area. Women who had births within the past one-year preceding the survey were participants of the study. The study was part of big study dealing with maternal

service utilization and determinants of use in North Gondar Zone. The sample size was estimated based on a single population proportion formula. By assuming a 5% margin of error, 95% confidence level, and at least 50% of women expected to seek assistance from a skilled provider, about 384 women with complications were needed to estimate the rate of skilled maternal care for complications.

Multistage sampling procedure was applied to select study participants. Initially, six districts of North Gondar were selected. Then twelve “kebeles” (two kebeles per district) were selected randomly. The “kebeles” (used as clusters) are the lowest administrative units in Ethiopia. All eligible women living in the selected clusters were studied. The data collection tool was adapted from DHS and other maternal and child health surveys. The questionnaire included a range of closed and open-ended questions on socio-demographic characteristics, awareness, perceptions and experiences related to maternal complications and use of skilled maternal care services. Questions related to care of complications include: the type of provider who gave assistance (if assistance was sought); the type of facility; person who made the decision for care-seeking; the type of transport used; estimated time and distance to reach facility; waiting time at health facility; the major type of care provided at a health facility, and the cost expenditure for transport and care. The data collectors and supervisors were diploma and degree graduates, respectively. A total of 36 data collectors and supervisors (2 data collectors and 1 supervisor for each kebele) were trained and deployed. The interviews were conducted in Amharic after questions were pretested for cultural appropriateness and clarity.

In the context of this study, skilled maternal care refers to maternity services by a health professional with midwifery skills that can be provided at different levels (home, health centers or hospitals). Health professionals, who have been effectively educated and trained in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, as well as in the identification, management or referral of complications are categorized as skilled care providers [14,15]. In the study, skilled providers include midwives, nurses, health officers and doctors while non-skilled providers include health extension workers (HEWs), traditional birth attendants (TBAs) and relatives or family members who cannot fulfill the definition of a skilled provider.

The unprompted responses (listed responses spontaneously for open questions) and prompted responses (selected responses from the available choices) were reviewed. Then data cleaning was performed to check for accuracy, consistency, missed values and variables. Data entry was done using Epi Info version 3.5.3 and was exported to SPSS for analysis. Tables, graphs and texts were used to present the study findings. To indicate the accuracy of the estimates, 95% CI was constructed for proportions. Logistic regression was applied to control confounding variables.

Ethics statement. Before the commencement of the study, ethical clearance was obtained from the Institutional Review Board of the College of Health Sciences, Addis Ababa University. During data collection, consent was sought and all participants signed written agreements (consent forms) after they were introduced to the purpose of the study and informed about their rights to interrupt the interview on desire. To ensure confidentiality, names were avoided in reporting the results of the study. In addition, the collected information was locked with a key (hard copies) and by passwords (soft copies). The Institutional Review Board approved all ethical procedures, based on awareness about the type of study (that it was harmless to study subjects) and the

characteristics of the participants (women aged 15 years and above who had given birth within one year preceding the survey).

Results

Socio-demographic characteristics of the study population

In the study, 1,668 eligible women were identified. The large majority (92.7%) of the women were married. At the time of their last birth, about 73.3% were between 20–34 years of age; 5.5% were teenagers (less than 20 years), and 21.2% were elderly gravid (35 years and above). The mean ($\pm$ SD) age was 28.2 ($\pm$ 6.6) years, with a range of 16–51 years. The last birth for one-fifth of the mothers was the first, while it was the second or third for 39%; fourth or fifth for 26%, and more than fifth for 14%. The majority of the interviewed mothers (71%) and their husbands (63.4%) had no formal education (Table 1).

Awareness and perceptions related to obstetric complications and skilled maternal care

About 60% of women had heard about skilled maternal care (at the time of pregnancy, delivery and postpartum), and 59% had heard about the importance of birth preparedness (Table 2). Of the total unprompted responses, the main sources of information about the importance of birth preparedness were health professionals (24.9%), TBAs and HEWs (22.9%), and families (16.3%) which were mentioned by 44.6%, 41%, and 29.1% of the women, respectively.

In order to assess awareness of complications during pregnancy, childbirth, or soon after delivery, women were asked to list danger signs spontaneously. Out of the total unprompted responses, excessive bleeding (they called it 'serakian') (22%), prolonged labor (18.2%), and retained placenta (16.9%) were the top three listed danger signs. Such complications were mentioned by 65.3%, 54.2%, and 50.3% of women, respectively. The majority (55.2%) of the respondents mentioned health center as their place to get a skilled attendant, while the rest 27.4%, 3.1%, and 0.7% mentioned government hospital, health post, and private clinic, respectively (Table 2).

Mothers were asked about their perceptions on complications and the need for skilled providers. About 72.6% thought that some groups of women were at higher risk of complications compared with others. Based on prompted responses, a significant proportion of the participants believed that women in advanced age (67.8%), women giving frequent births (53.2%), poor women (51%), women in their first pregnancy (48.3%), those with pregnancy in early age (43.9%), short women (43.7%), and women giving multiple births (41.3%) are at higher risk of developing complications. Women were also asked to mention the better (safer) delivery attendant according to their perception. About 57% perceived that health professionals were better and safer birth attendants, while 34.5% and 5.8% preferred TBAs and relatives, respectively (Table 2).

About 54.8% of the women agreed on the need for a postnatal check up. However, only a few (15.2%) of the respondents supported the idea that leaving home/compound/in the first seven days after delivery is safe (Table 2). Many of the respondents (72%) preferred to stay at home in the first 10 days. Most women, 75.7% and 75.5% agreed on the importance of planning the place of delivery and for possible complications, respectively (Table 2). In the bivariate analysis, the awareness of women about where to get skilled providers and the risk of pregnancy showed that there was a significant association with seeking skilled provider during complications. Moreover, agreement on postnatal check up, planning delivery place, planning for possible complication and

Table 1. Frequency and percentage distribution of respondents according to selected socio-demographic characteristics, North Gondar, 2012.

Characteristics	n	%
Residence (District)	Dabat	293
	Debank	244
	Dembia	294
	L.Armachiho	228
	Metema	306
	W.Belesa	303
Religion	Orthodox	1546
	Muslim	104
Ethnicity	Amhara	1536
	Qimant	78
	Tigrawi	43
Marital status	Never married	77
	Married	1537
	Divorced	37
	Widowed	7
Birth order	1	335
	2–3	657
	4–5	439
	6+	237
Mother's education	No education	1183
	Primary	327
	Secondary	138
	>Secondary	20
Husband's education	No education	1057
	Primary	430
	Secondary	154
	>Secondary	27
Wealth index	Lowest	331
	Second	340
	Middle	306
	Fourth	357
	Highest	334

*The index of wealth status was computed by principal component analysis from ten variables (presence of own farmland, own toilet facility, bank account, mobile phone, electricity, roof of house with corrugated iron sheet, number of cows/oxen, horses/mules/donkeys, goats/sheep and chicken). The index was developed by categorizing sum of components in to five groups and it was ranked from poorest to wealthiest quintile.
doi:10.1371/journal.pone.0060171.t001

belief that leaving compound in the postpartum period is safe showed a significant contribution to seek assistance at the time of complications (Table 2).

Experiences of complications and assistance by a skilled provider

In total, 476 women (28.5%, 95% CI; 26.4%, 30.7%) reported some kind of complication. Ninety (5.4%; 95% CI, 4.3%, 6.5%), 224 (13.4%, 95% CI; 11.8%, 15.1%) and 274 (16.4%; 95% CI, 14.6%, 18.2%) women faced complications during pregnancy, intra-partum and postpartum periods. The most common

Table 2. Awareness and perceptions related to obstetric complications and the need of skilled maternal care among women having birth within one year preceding the survey, North Gondar, 2012.

Awareness and perceptions	From total sample	Sought assistance during complication (n = 476)		
	Yes *n (%)	No(228) n (%)	Yes (248) n (%)	OR(95%CI)
Heard about skilled care (n = 1668)	995 (59.7)	135 (46.6)	155 (53.4)	1.15 (0.80, 1.66)
Heard about birth preparedness (n = 1668)	985 (59.1)	126 (45.0)	154 (55.0)	1.33 (0.92,1.91)
Respondent's known place to get skilled attendants (unprompted responses) (n = 1535)		175 (44.4)	219 (55.6)	2.29 (1.40, 3.75)
Government hospital	421 (27.4)			
Government health center	848 (55.2)			
Health post	48 (3.1)			
Private clinic	10 (0.7)			
Thought that some group of women are at higher risk of complications than others (n = 1579)	1146 (72.6)	139 (41.2)	198 (58.8)	2.536 (1.69, 3.82)
Group of women considered at higher risk by respondents (prompted responses)				
Advanced age (n = 1508)	1023 (67.8)			
Frequent births (n = 1505)	801 (53.2)			
Poor women (n = 1497)	763 (51.0)			
First pregnancy (n = 1508)	729 (48.3)			
Early age (n = 1505)	660 (43.9)			
Short stature (n = 1494)	653 (43.7)			
Multiple births (>5 five birth) (n = 1505)	621(41.3)			
Thought that the selected delivery attendants are better (safer) than the others (n = 1667)				
Health professionals	955 (57.3)	121 (44.5)	151 (55.5)	1.38 (0.96, 1.98)
TBA	575 (34.5)			
Relatives	97 (5.8)			
Agreed on the need of post natal check up (n = 1643)	901 (54.8)	113 (43.8)	145 (56.2)	1.43 (1.00, 2.06)
Agreed on the idea that leaving the house/compound/in the first seven days after delivery is safe (n = 1634)	248 (15.2)	26 (34.2)	50 (65.8)	1.96 (1.18, 3.28)
Agreed on the importance of planning delivery place (n = 1632)	1236 (75.7)	161 (44.5)	201 (55.5)	1.78 (1.16, 2.73)
**Agreed on the need of having a plan on possible complications (n = 1606)	1195 (75.5)	152 (42.1)	209 (57.9)	2.68 (1.73, 4.16)

*n represents those who say "Yes" and its percentage is calculated from total (Yes+No).

**Evaluation of agreement was considered based on the following question. "A woman should plan ahead of time what she will do if she has a serious health problem related to pregnancy or childbirth. Do you agree by this idea?"

doi:10.1371/journal.pone.0060171.t002

reported complications were excessive bleeding (58.4%), and prolonged labor (23.7%). Most women encountered these complications at the time of delivery and immediate postpartum period (Table 3).

Out of the total women who faced complications, 282 (59.2%, 95% CI, 54.8%, 63.7%) sought assistance. Most, 248 (52.1%), of the assistances were by skilled providers (doctors (5.9%), health officers (4.4%) and nurses/midwives (39.5%)), and some, 34 (7.1%), were by non-skilled providers (Table 4).

Reasons for not seeking assistance during complications

Some of the women who reported complications did not seek services due to the following reasons: Inability to judge the graveness of condition (38.4%), distance/transport problems (22.6%), lack of money/cost considerations (19.5%), and use of traditional options at home (13.1%). The reasons varied with relative difference in wealth. The main reason for the lowest

(poorest) quintile was lack of money/cost consideration (32.8%), followed by inability to judge the graveness of condition (30.7%), and use of home remedy (15.4%), whereas the main reasons for the wealthiest quintile were others, mainly quality of service (26.3%), use of home options (23.1%) and transport problems (22.4%) (Figure 1).

Factors associated with seeking assistance at the time of obstetric complications

The multivariable analysis carried out using binary logistic regression indicated that three variables: the wealth index, having ANC by a skilled provider, and agreement of a woman to plan for possible complications were the factors found to be significantly associated with seeking assistance from a skilled provider. Wealthier women (who belonged to the second quintile) were 2.5 times (OR = 2.5, 95% CI; 1.3, 4.6) more likely to be assisted by a skilled provider at the time of obstetric complication than women

Table 3. Frequency and percentage distribution of self-reported complication encountered by women in their last birth within one year preceding the survey, North Gondar, 2012.

Type of self reported complications	Frequency and percentage by different time periods - n (%)			
	During pregnancy	During Intra-partum period	During Postpartum period	At least one complication throughout the periods
Excessive bleeding	72(80.0)	85(37.9)	221(80.7)	278(58.4)
Prolonged labor		113(50.4)		113(23.7)
Convulsion	6(6.7)	18(8.0)	10(3.6)	34(7.1)
High Fever/sepsis	5(5.6)		21(7.7)	21(4.4)
Body swelling	6(6.7)	6(2.7)	15(5.5)	20(4.2)
**Others	1 (1.1)	2(0.9)	7(2.6)	10 (2.1)
Total	90(100)	224(100)	274(100)	*476(100)

*Some complications can be persisted or repeated at different periods (pregnancy to postpartum) and the total values can be different from the summations.

**Stillbirth, fistula and severe anemia.

doi:10.1371/journal.pone.0060171.t003

in the poorest quintile. Women who had antenatal care by a skilled provider were about two times (OR = 1.7, 95% CI; 1.1, 2.7) more likely to seek assistance from a skilled provider during obstetric complication compared with women who did not have antenatal care. Similarly, mothers who agreed to plan for possible complications were 2.5 times (OR = 2.5, 1.6, 3.9) more likely to seek assistance from a skilled provider at the time of obstetric complication compared with women who did not agree (Table 5). The significant association observed during the bivariate analysis of some variables, like birth order and education of mothers and their husbands disappeared during the multivariable analysis.

Discussion

This study attempted to assess experiences related to obstetric complication and seeking assistance from a skilled provider among women who gave birth in the last 12 months prior to the study. The multivariable analysis showed that the agreement of a woman to plan for possible complications was one of the important factors

found to be significantly associated with seeking assistance from a skilled provider. However, a significant proportion (40%) of women did not have any information about skilled maternal care or the importance of birth preparedness. The agreement to plan a delivery place and for possible complications was also much lower than the expectation.

In this study, having ANC by a skilled provider was significantly associated with seeking assistance from a skilled provider. The contribution of ANC to further maternal service utilizations, like delivery care, was observed in previous studies conducted in Ethiopia [16]. Its positive effect for timely care-seeking during obstetric complications was also observed in studies outside Ethiopia [17]. According to the standards of the World Health Organization, 'All pregnant women should have a written plan for birth and for dealing with unexpected adverse events, such as complications or emergencies, and should discuss this plan with a skilled attendant at each antenatal assessment and at least one month prior to the expected date of birth' [18]. However, only one-third of the women had ANC by a skilled provider.

The results of the study showed that nearly two-thirds of the mothers were able to mention at least one danger sign spontaneously though majority knew only bleeding. Bleeding was a common danger sign mentioned in another study in Adigrat, Ethiopia. However, fewer number of mothers (15.4%) spontaneously mentioned at least one key danger sign compared with our study [19]. This difference may be due to improvements in awareness by the current expansion of primary health care facilities and the Community Based Health Extension Program. In the Health Extension Program, the target of one health post and two health extension workers per kebele has been reached [20]. Globally, hemorrhage is the leading cause of maternal death. It is also the major known cause of maternal mortality in Sub-Saharan Africa, which accounts for about 34% of total deaths [21]. Retained placenta, prolonged labor (when the uterus fails to contract) and bleeding during pregnancy (due to low lying and early separation of placenta) are the common causes of hemorrhage. Awareness of danger signs or complications helps women to seek care timely.

About 28.5% of the women reported at least one kind of maternal morbidity perceived to be serious. Most women encountered these complications at the time of delivery and immediate postpartum period. This reflects the fact that most maternal deaths occur in the first week of the postpartum period,

Table 4. Type of providers assisting mothers at the time of complication in their last birth within one year preceding the survey, North Gondar 2012, n = 476.

		95% CI (%)		
		No (%)	Lower	Upper
By Skilled providers	Doctor	28(5.9)	3.8	8.0
	Health officer	21(4.4)	2.6	6.3
	Midwife/Nurse	188 (39.5)	35.1	43.9
	Unclassified skilled provider	11(2.3)	1.0	3.7
	Total	248(52.1)	47.6	56.6
By Non-skilled providers	HEW	28(5.9)	3.8	8.0
	TBA	4(0.8)	0.2	1.3
	Relatives	2(0.4)		
	Total	34(7.1)	4.8	9.5
Total assisted (skilled & Non skilled)		282(59.2)	54.8	63.7
No Assistance		194(40.8)	36.3	45.2

doi:10.1371/journal.pone.0060171.t004

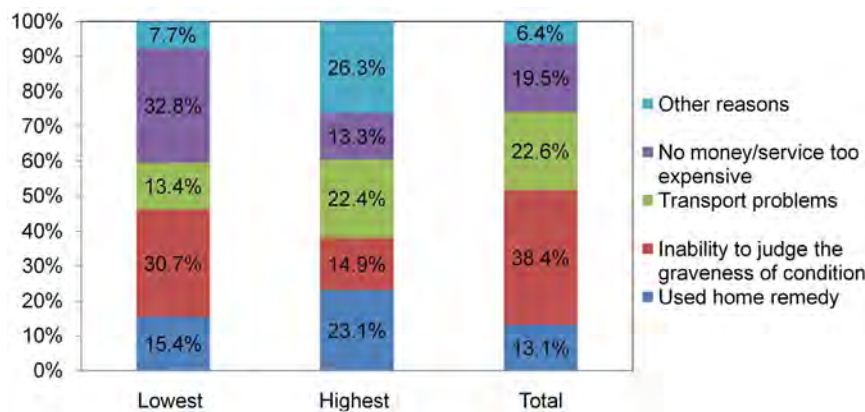


Figure 1. The main reasons for not seeking assistance at the time obstetric complications, North Gondar 2012.

doi:10.1371/journal.pone.0060171.g001

mainly in the first and second days after birth [1]. Excessive bleeding (named as ‘serakian’) was the common problem mentioned. Many studies reveal that hemorrhage is the most common type of obstetric complication and that it is the top direct obstetric cause of maternal death [1,22]. According to further interviews of mothers and families experiencing complications, bleeding is associated with evil spirits. In their view, it is a killer unless managed immediately by the known traditional methods.

About half of the women who faced complications had sought assistance from skilled providers. Studies in other countries

indicated higher percentage of care-seeking for maternal morbidities. For instance, in rural Haiti, 75% of pregnant women reported seeking care in the formal health sector for a pregnancy-related illness [23]. The differences may be due to the overall maternal service utilization pattern which is very low in Ethiopia [5]. Most of the assistances were by mid-level health care providers, nurses or midwives. This is because health centers are the common places for getting skilled providers, and such health professionals run most health centers.

Table 5. Multivariable analysis of factors associated with assistance by a skilled provider at the time of obstetric complications among women who gave birth within one year preceding the survey, North Gondar 2012.

Variables			Assisted by a skilled provider		Adjusted OR	95.0% C.I.	
			Yes (%)	No (%)		lower	Upper
Number of births	1	87	62.1	37.9	1.0		
	2–3	186	46.8	53.2	0.5	0.3	1.1
	4–5	122	54.1	45.9	1.0	0.6	1.8
	6+	81	50.6	49.4	0.8	0.4	1.4
Mother’s education	Illiterate	354	52.3	47.7	1.0		
	Primary	79	43.0	57.0	1.0	0.4	2.5
	Secondary & above	43	67.4	32.6	1.5	0.6	4.0
Husband’s education	Illiterate	323	50.5	49.5	1.0		
	Primary	103	52.4	47.6	1.1	0.5	2.6
	Secondary & above	50	62.0	38.0	1.3	0.6	3.1
Wealth index	Lowest	98	36.7	63.3	1.0		
	Second	97	56.7	43.3	2.5*	1.3	4.6
	Middle	83	47.0	53.0	1.1	0.6	2.1
	Fourth	91	56.0	44.0	1.7	0.9	3.2
	Highest	107	62.6	37.4	1.2	0.6	2.1
Have ANC by a skilled provider	No	315	46.0	54.0	1.0		
	Yes	161	64.0	36.0	1.7*	1.1	2.7
Have agreement to plan for possible complications	No	115	33.9	66.1	1.0		
	Yes	361	57.9	42.1	2.5*	1.6	3.9

*Significant associations, $P < 0.05$.

doi:10.1371/journal.pone.0060171.t005

This study revealed that some of the women who reported complications did not seek services due to reasons, like inability to judge the graveness of the condition, distance/transport problems, lack of money/cost considerations and use of traditional options at home. Inability to understand the severity of the problem was identified as one of the major reasons for delay or not seeking service at the time obstetric complications by different studies [24,25].

In this study, the reasons for not seeking skilled providers at the time of obstetric complications differed according to wealth gradient. Lack of money/cost consideration, inability to judge the severity of the problem, and use of home remedy were the top reasons among the poorest women, whereas perceived quality of service and other reasons, such as use of home options and transport problems were the main reasons for the wealthiest women. In addition, women in the lowest wealth quintile were less likely to seek skilled providers at the time of complication compared with wealthier women in any other quintiles. The strong influence of the mothers' wealth status on the utilization of healthcare services during complications is consistent with findings of other studies conducted elsewhere. Many studies indicate that a woman belongs to the lowest economic status are highly associated with poor maternal service utilization, especially during delivery and emergency conditions [26,27]. In some studies economic status emerges as a more crucial determinant of institutional care-seeking for child birth than access [28].

The other major reasons, identified by this study, including distance/transport problems, lack of money/cost considerations and use of traditional options at home were also observed in previous studies conducted in Ethiopia and abroad. A nationwide qualitative study in Ethiopia revealed that distance, cost and lack of support for the cultural practices around birth were major barriers for seeking maternal care. Seeking care for complications was considered only after traditional options, like local or herbal remedies and prayer were tried and proved unsuccessful [29]. According to the estimates of clients and data collectors, the average distance to reach a nearby basic obstetric care facilities (health centers) was 5.5 ± 4 kilometers with a range of 1.5 to 15 kilometers. The mean travel time on foot was about 57.7 ± 38.4 minutes, with a range of 10–120 minutes. In the case of some complications, like obstructed labor, women need to travel long distances to reach a hospital with comprehensive emergency obstetric care (that is only Gondar Hospital in the zone). Many districts like Janamora, Beyeda, Quara, Abderafi and Tselemt are 200 kilometer and beyond from the hospital. Cost of transport was the most important expenditure mentioned by women. When referred to the hospital, women need to pay up to Birr 1200 (\$67) to rent a car. Women also mentioned expenses to buy supplies at health facilities. Currently, the Ministry of Health is distributing at least one ambulance to each district and avail free maternal services for poor women. However, the problem of transportation and service availability remain persistent challenges in the area.

Preferences for traditional options were related to perceptions and beliefs about the causes of complications. This study revealed that the majority of the mothers preferred to stay at home for the first 10 days, and only a few (15.2%) of the respondents supported the idea that leaving the home/home yard/in the first seven days after delivery is safe. This was identified as an important barrier to

seek service for most of the complications, which usually occur during the postnatal period. According to the local tradition, postpartum complications and postpartum psychosis (in Amharic, 'Menekat') are associated with evil spirits with different names ('tselay or tselay senay', 'tezewawari', 'telalafi', 'buda'). According to the explanations of respondents, families must look after the mother in her early postpartum period and never leave her all alone in the house. The community believes that a plant called "Demeketir" is one of the traditional remedies for stopping excessive bleeding at home. They believe that it can stop the bleeding when tied to the mother's hand, neck or waist, even at the time of cutting the plant.

Limitations

The perception of symptoms of morbidity by women may vary compared with a trained personnel or when measured with certain instruments. Therefore, the reliability of self-reported complications based on a woman's recall may be limited compared to the results of medical examinations at health care facilities. Judging the severity of the illness is also a challenge. However, women's self-report will be the primary option for capturing maternal morbidity in places where women do not usually use skilled care providers or facilities for maternal services. The fact that women who died from obstetric complications were excluded from the study, might underestimate the results.

Conclusions

This study showed that nearly half of the women who faced complications did not use skilled providers at the time of obstetric complications. The listed reasons and the multivariate analysis indicated that cognitive, geographic, economic and cultural barriers were involved for not using skilled maternal care at the time of obstetric complications.

Health behavior education on obstetric complications and local cultural beliefs is very important, especially for the poor, and for those who do not come for ANC. Geographic and economic access should be improved through strengthening community-based maternal services by health centers and should be carefully tailored to the local cultural beliefs. Moreover, ensuring comprehensive emergency obstetric care at rural hospitals and providing free maternal health care services are crucial steps to address the problem.

Acknowledgments

We are very grateful to Addis Ababa University for the approval of the ethical clearance and its technical and financial support. We would like to extend our heartfelt thanks to Professor Henry Mosley for his valuable comments starting from proposal development to the final manuscript preparation. We would also like to thank all of the study subjects who participated in this study for their commitment in responding to our interviews.

Author Contributions

Equally involved in the development of the proposal: AGW AWY MFA. Participated in data collection: AGW AWY. Participated in analysis: AGW AWY. Prepared the draft: AGW. Revised drafts of the paper: AWY MFA. Read and approved the final manuscript: AGW AWY MFA.

References

1. Ronsmans C, Graham WJ (2006) Maternal mortality: who, when, where, and why. *Lancet* 368: 1189–1200.
2. WHO (2010) Trends in maternal mortality: 1990 to 2008. Estimates developed by WHO, UNICEF, UNFPA and The World Bank. Geneva: WHO.
3. UN (2011) The Millennium Development Goals Report 28–35.
4. Bryce J, Daelmans B, Dwivedi A, Fauveau V, Lawn JE, et al. (2008) Countdown to 2015 for maternal, newborn, and child survival: the 2008 report on tracking coverage of interventions. *Lancet* 371: 1247–1258.

5. CSA/Ethiopia ICF International (2012) Ethiopia demographic and health survey 2011. Addis Ababa, Ethiopia and Calverton, Maryland, USA.
6. Filippi V, Ronsmans C, Campbell OMR, Graham WJ, Mills A, et al. (2006) Maternal health in poor countries: the broader context and a call for action. *Lancet* 368: 1535–1541.
7. Campbell OMR (1991) Measuring the Determinants of Maternal Morbidity and Mortality: Defining and Selecting Outcomes and Determinants, and Demonstrating Associations. London: School of Hygiene and Tropical Medicine.
8. Koblinsky M, Chowdhury ME, Moran A, Ronsmans C (2012) Maternal Morbidity and Disability and Their Consequences: Neglected Agenda in Maternal Health. *Journal of health, population, and nutrition* 30: 124–130.
9. UNICEF (1997) Guidelines for monitoring the availability and use of obstetric services. New York: UNICEF. pp. 103
10. WHO (2009) Monitoring Emergency Obstetric Care: A Handbook, WHO, UNICEF, UNFPA and AMDD: World Health Organization.
11. Ann C (2009) Review of global literature on maternal health interventions and outcomes related to skilled birth attendance. Amsterdam: KIT.
12. Filippi V, Ganaba R, Baggaley RF, Marshall T, Storeng KT, et al. (2007) Health of women after severe obstetric complications in Burkina Faso: a longitudinal study. *Lancet* 370: 1329–1337.
13. Iyengar K, Yadav R, Sen S (2012) Consequences of maternal complications in women's lives in the first postpartum year: a prospective cohort study. *Journal of health, population, and nutrition* 30: 226–240.
14. Carlough M, McCall M (2005) Skilled birth attendance: what does it mean and how can it be measured? A clinical skills assessment of maternal and child health workers in Nepal. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics* 89: 200–208.
15. Harvey SA, Ayabaca P, Bucagu M, Djibrina S, Edson WN, et al. (2004) Skilled birth attendant competence: an initial assessment in four countries, and implications for the Safe Motherhood movement. *International Journal of Gynecology & Obstetrics* 87: 203–210.
16. Nigusie M, Mariam DH, Mitike G (2004) Assessment of safe delivery service utilization among women of childbearing age in North Gondar Zone, North West Ethiopia. *Ethiopian Journal of health development* 18: 145–152.
17. Rööst M, Altamirano VC, Liljestrand J, Essén B (2010) Does antenatal care facilitate utilization of emergency obstetric care? A case-referent study of near-miss morbidity in Bolivia. *Acta obstetrica et gynecologica Scandinavica* 89: 335–342.
18. WHO (2006) Standards for Maternal and Neonatal care. Birth and emergency preparedness in antenatal care. Integrated management of pregnancy and childbirth (IMPAC). Geneva, Switzerland: Department of making pregnancy safer, WHO.
19. Hiluf M, Fantahun M (2007) Birth Preparedness and Complication Readiness among women in Adigrat town, north Ethiopia. *Ethiop J Health Dev* 22: 14–20.
20. Koblinsky M, Tain F, Asheber Gaym, Ali Karim MC, Tesfaye S (2010) Responding to the maternal health care challenge: The Ethiopian Health Extension Program. *Ethiop J Health Dev* 24 Special Issue: 105–109.
21. Khan KS, Wojdyla D, Say L, Gülmezoglu AM, Van Look PFA (2006) WHO analysis of causes of maternal death: a systematic review. *Lancet* 367: 1066–1074.
22. Cristina Rossi A, Mullin P (2012) The etiology of maternal mortality in developed countries: a systematic review of literature. *Archives of gynecology and obstetrics* 285: 1499–1503.
23. White K, Small M, Frederic R, Joseph G, Bateau R, et al. (2006) Health seeking behavior among pregnant women in rural Haiti. *Health care for women international* 27: 822–838.
24. Deribe K, Biadgilign S, Amberbir A, Belachew T, Woldemichael K (2010) The Road to Maternal Death In Rural Southwest Ethiopia. *Ethiopian Journal of Health Sciences* 20: 71–74.
25. Killewo J, Anwar I, Bashir I, Yunus M, Chakraborty J (2006) Perceived delay in healthcare-seeking for episodes of serious illness and its implications for safe motherhood interventions in rural Bangladesh. *Journal of health, population, and nutrition* 24: 403–412.
26. Chowdhury RI, Islam MA, Gulshan J, Chakraborty N (2007) Delivery complications and healthcare-seeking behaviour: the Bangladesh Demographic Health Survey, 1999–2000. *Health & social care in the community* 15: 254–264.
27. Mahabub-Ul-Anwar M, Rob U, Talukder MN (2006) Inequalities in maternal health care utilization in rural Bangladesh. *International quarterly of community health education* 27: 281–297.
28. Kesterton AJ, Cleland J, Sloggett A, Ronsmans C (2010) Institutional delivery in rural India: the relative importance of accessibility and economic status. *BMC Pregnancy and Childbirth* 10: 30–30.
29. Warren C (2010) Care seeking for maternal health: challenges remain for poor women. *Ethiop J Health Dev* 24 Special Issue: 100–104.

Paper- III



RESEARCH

Open Access

Availability and components of maternity services according to providers and users perspectives in North Gondar, northwest Ethiopia

Abebay Gebeyehu Worku^{1*}, Alemayehu Worku Yalew² and Mesganaw Fantahun Afework³

Abstract

Background: The goal of reducing maternal mortality can be achieved when women receive important service components at the time of their maternity care. This study attempted to assess the availability and the components of maternity services according to the perspectives of service users and providers.

Method: A linked facility and population-based survey was conducted over three months (January to March 2012) in North Gondar Zone. Twelve kebeles (clusters) were selected randomly from six districts to identify maternity clients cared for by skilled providers. Then 12 health centers and 3 hospitals utilized by the corresponding cluster population were selected for facility survey. Interview with facility managers/heads, providers and clients and observations were used for data collection. Data were entered using Epi Info and were exported to SPSS software for analysis.

Results: Antenatal and delivery care were available in most of the visited facilities. However, the majority of them were not fully functioning for EmOC according to their level. Signal functions including administration of anticonvulsants and assisted vaginal delivery were missing in seven and five of the 12 health centers, respectively. Only one hospital met the criteria for comprehensive emergency obstetric care (performed cesarean section). Only 24% of the providers used partograph consistently. About 538 (32.3%) and 231 (13.8%) of the women received antenatal and delivery care from skilled providers, respectively. Most of the services were at health centers by nurses/midwives. At the time of the antenatal care, women received the important components of the services (percentage of users in bracket) like blood pressure checkup (79%), urine testing (35%), tetanus immunization (45%), iron supplementation (64%), birth preparedness counseling (51%) and HIV testing (71%). During delivery, 80% had their blood pressure measured, 78% were informed on labor progress, 89% had auscultation of fetal heartbeat, 80% took drugs to prevent bleeding and 78% had counseling on early & exclusive breast-feeding.

Conclusion: Antenatal and delivery care were available in most of the visited facilities. However, important components of both the routine and emergency maternity care services were incomplete. Improving the functional capacity of health facilities for the delivery of routine maternity and EmOC services are needed.

Keywords: Availability of maternal service, Components of maternity care

* Correspondence: gabebaw2worku@gmail.com

¹Department of Reproductive Health, Institute of Public Health, University of Gondar, Gondar, Ethiopia

Full list of author information is available at the end of the article

Background

Utilization of maternal health services by skilled providers, a proximate indicator of maternal survival, is very low in Ethiopia. According to the recent (2011) Ethiopian Demographic and Health Survey (EDHS) report, only 34%, 10% and 6% women have antenatal (ANC), delivery, and postnatal care by a skilled provider, respectively [1].

One of the key factors for the utilization of skilled maternal care is access to and availability of health care facilities. Evidences from many developing countries, including Mali, South Africa, Zambia, Paraguay, Uganda and Tanzania indicate that the proximity of maternal health services to users and a reliable transportation system to link the community and health facilities are critical for maternal service utilization [2-5]. The availability of basic and comprehensive emergency obstetric care (signal functions) in a health care system are crucial for maternal survival [6]. Signal functions, including parenteral antibiotics, anticonvulsants and oxytocics, manual removal of placenta, removal of retained products, assisted vaginal delivery and neonatal resuscitation (at basic emergency obstetric care facility) with the addition of cesarean delivery and blood transfusion (at comprehensive emergency obstetric care facility) used to treat direct obstetric complications cause the majority of maternal deaths [7].

In order to have a better health care access, Ethiopia has introduced a three-tier health care delivery system. The first level is the primary health care unit or district health system comprising a primary (district) hospital (to cover 60,000-100,000 people), health centers (1/15,000-25,000 population), and their satellite health posts connected to each other by a referral system. Level two is a general hospital covering a population of 1-1.5 million people, and level three is a specialized hospital covering a population of 3.5-5 million people [8]. District level facilities are organized to provide obstetric first aid at health post levels with early referral to health centers that can provide basic emergency/essential obstetric care and further referral to district hospitals for comprehensive emergency/essential obstetric care.

Once the mother arrives at the health facility, she has to have access to a medical professional who has the skills and equipment to give the necessary services. However, in many developing countries, health facilities do not perform their expected functions according to their level. For instance, a study on health facilities in 13 countries found out that most hospitals did not provide life saving services fully. In the study, assisted vaginal delivery was missing in 42%, 73%, 38%, and 19% of the hospitals in Benin, Mali, Morocco, and Uganda, respectively. The removal of retained products was missing in 12%, 9% and 12% of the hospitals in Benin, Mali and Morocco, respectively [9]. Similar studies revealed the

fact that facilities were not performing what they were supposed to [10].

Studies showed that many facilities suffered from staff training deficiencies that hindered the provision of specific services. In many settings, midlevel providers such as midwives were not trained or authorized to perform some of the key procedures expected from a skilled attendant. A study in Benin, Ecuador, Jamaica, and Rwanda showed a wide gap between current evidence based standards and current levels of provider competence. In the study, providers answered 55.8% of the knowledge questions and performed 48.2% of the skills steps correctly [11,12]. Pre-service training is also not a guarantee. It is recommended that maternity care providers receive refresher training or updates in midwifery every three to five years [13].

In Ethiopia, many of the previous studies have reported ANC, delivery and postnatal care coverage as utilization of maternal services. However, achieving the goals of maternal health care (reduction in morbidity and mortality) depends more on utilization of important service components (better quality of care) than high coverage of the services. Essential interventions (service components) provided before pregnancy, during pregnancy, delivery, and postpartum are outlined in the WHO documents and lancet article [14,15]. In the country, there is limited evidence about specific service components and the performance of health facilities at the time of maternity care. Therefore, the question, "What kind of service is available and is delivered by a skilled provider at the time of maternity care?" needs an appropriate answer for planning as well as, monitoring maternal health services. This study was planned to assess the availability and components of maternity services in both routine and emergency situations according to providers and users perspectives in North Gondar.

Methods

Two surveys, including the facility survey, to collect information from the providers and clients, and the interviews with the population to gather information from users' were carried out concurrently. As suggested in the manuals [16], the facility survey was linked to the population-based survey sample areas. The study was conducted over three months (January - March 2012) in North Gondar Zone. The zone has 22 'woredas' (districts). According to the figures from the central statistical agency, 2007, this zone had an estimated total population of 2,921,470, about 84.1% of which were rural dwellers [17]. In the zone, there is only one referral hospital with a comprehensive emergency obstetric care. There are also about a hundred health centers and two district hospitals. The zone, which is the largest of the region, has a difficult topography.

In order to get a sufficient number of maternal care users, a total of twelve clusters or kebeles (the lowest administrative units having clear geographical boundary and administrations) were selected randomly from six districts, namely Dembia, Lay Armachiho, West Belessa, Metema, Debark and Dabat. All women who had births one-year preceding the survey and who received maternal care during pregnancy and delivery were included in the sample. Based on 34% and 10% coverage of skilled antenatal and delivery care [1], the sample size was determined on the assumption of 95% confidence level and 4% of worst acceptable error. In the selected clusters, 538 and 231 of the eligible women were skilled antenatal and delivery care users.

One of the options for sampling facilities in a linked survey is determine the nearest facility, or facilities, to each population-based survey cluster and conduct the facility survey in all identified. In this approach, the sample size is improved by assuring that the number of facilities is no less than the number of population-based clusters. Based on this recommendation, we have identified one basic essential obstetric care facility (health center utilized by the cluster population) for each selected cluster (kebele). Twelve health centers and three hospitals serving the selected kebele population were included for the facility survey. Interview with managers/heads of health institutions and observation were used to collect data related to the availability, readiness, and functioning of facilities for the provision of skilled maternal care. During observation, a checklist containing infrastructure, equipment, drugs and supplies, and laboratory tests was prepared. Based on adequacy and functional status, most of the findings were rated as 0) not available (not functional), 1) available but unsatisfactory and 2) available and functional. In addition, all midlevel skilled care providers who were directly involved in maternity care at these health centers and district hospitals (38 skilled providers) were interviewed about their training and skills for different types of procedures. A skilled attendant is an accredited health professional who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns [18,19]. In this study, skilled providers included midwives, nurses, health officers and doctors. Health officers are those trained for four years to get their Bachelors degree and they work as clinician in the rural set up (health centers).

Thirty-six data collectors and supervisors (2 data collectors and 1 supervisor for each kebele) were trained and deployed for identifying and interviewing maternal care users. The interviews were conducted using the local language (Amharic) after the questionnaire was

pretested for cultural appropriateness and clarity. To conduct the facility-based survey, 14 experienced health professionals were recruited. After the appropriate coding, the data was entered in Epi Info version 3.5.3 software, and exported to SPSS software for analysis.

Before the commencement of the study, ethical clearance was obtained from the Institutional Review Board of the College of Health Sciences, Addis Ababa University. During data collection, the study participants were asked for consent and informed to interrupt the interview on desire. All participants signed written agreements (consent forms). To ensure confidentiality, names were not used in depicting the results of the study.

Results

Availability of the routine maternal services at health centers and hospitals

All facilities (hospitals and health centers) reported that they had ANC and family planning (FP) services. Most of the facilities, except one health center, claimed that they had delivery and PMTCT services, but one-fourth of the visited health centers did not have postnatal care in the first 7 days. Five out of the 12 health centers and all hospitals had safe abortion services (Table 1).

However, findings from the interview with skilled maternal care users indicated that out of the 1668 women who gave birth one year preceding the survey, only 538 (32.3%) and 231 (13.8%) received antenatal and delivery care from skilled providers, respectively. Of the total users of the ANC service, 86% received their care at health centers, and most (92%) of the users were served by nurses or midwives. Similarly, three-fourths of the births took place at health centers assisted by nurses or midwives.

None of the health centers visited had laboratory services for testing syphilis. Moreover, many health centers did not have laboratory tests for hemoglobin, urine for proteinuria, and cross match (Table 1).

Emergency obstetric care signal functions

A total of five health centers and all three hospitals fulfilled the criteria for signal functions for basic emergency obstetric care, but only Gondar Hospital fulfilled all the signal functions for comprehensive emergency obstetric care. Of the signal functions, parenteral antibiotics and oxytocics were practiced by all the facilities visited except one health center. However, important functions, including the administration of anticonvulsants and assisted vaginal delivery were missing in three-fifths and two-fifths of the health centers, respectively. Only one-fourth of the health centers had working ambulances to give referral service (Table 1).

Table 1 Availability of maternal services and laboratory tests in basic and comprehensive obstetric care facilities (selected health centers and all hospitals) in North Gondar, 2012

Type of services available in the facility	Number of visited facilities		
	Health centers (12)	Hospitals (3)	Total (15)
Availability of selected maternity related services			
Antenatal care	12	3	15
Delivery care	11	3	14
Postnatal care in the first 7 days	9	3	12
Family planning	12	3	15
VCT	10	3	13
PMTCT	11	3	14
Safe abortion	5	3	8
Maternity service for 24 hrs and 7 days a week	9	3	12
Working ambulance (referral service)	3	2	5
Signal functions to treat major obstetric complications			
Parenteral antibiotics	11	3	14
Parenteral oxytocics	11	3	14
Anticonvulsants	5	3	8
Manual removal of placenta	9	3	12
Removal of retained products	10	3	13
Assisted vaginal delivery	7	2	9
Cesarean section	0	1	1
Blood transfusion	0	2	2
Availability of selected laboratory tests			
Syphilis testing (VDRL)	0	3	3
Hemoglobin test	5	3	8
Urine test-proteinuria	6	3	9
Blood film-malaria	11	3	14
HIV test	12	3	15
Cross match tests	5	2	7

Important service components received during antenatal and delivery care

At the time of antenatal care, some women received important components of services (percentage of users in bracket) like blood pressure checkup (79%), urine testing (35%) tetanus immunization (45%), iron supplementation (64%), birth preparedness counseling (51%), saving money for possible complication (45.2%), and HIV testing (71%).

Among women who have delivery by a skilled attendant, about 80% had their blood pressure measured, 78% informed on labor progress, 89% had auscultation of fetal heartbeat, 80% took drugs to prevent bleeding and 78% had counseling on early & exclusive breast-feeding.

Weight was measured and vaccine was provided for babies of 67% and 69% of mothers, respectively. There are some differences in providing services by type of providers (Table 2).

Availability of essential drugs, supplies and equipment

The observation of facilities showed that essential drugs, including antibiotics, intravenous fluids, vaccines and contraceptives were available in the 15 selected facilities. Supplies, like gloves and syringes were also adequate. However, pieces of equipment (number of facilities out of 15 facilities in brackets), including thermometers (5), sphygmomanometers (7), foetoscopes (2), delivery set (5), episiotomy set (5), vacuum extractor (10), blank partograph (7), MVA set (8), bag and mask for neonatal resuscitation (7), sterilizer (5) and refrigerator (8) were either missing or nonfunctional at the time of visiting facilities. Similarly, private consultation rooms (5), delivery room (5), toilet facilities (7), water supply (8) and drainage system in the labor room (13) were unsatisfactory.

Providers training and skills to provide maternal services

Interview with providers directly involved in (assigned to) maternity care at basic obstetric care facilities (health centers and district hospitals) was done to assess providers training and their skills. From the interview, it was found that adequate training or on-the-job experience was obtained by the majority of providers for different types of procedures, including ANC risk screening (89%), partograph utilization (79%), intra-venous infusion (97%), episiotomy (87%), repairing vaginal tears (82%), active management of third stage (97%) and manual removal of placenta (92%). However, only a limited proportion of providers had adequate training or experience on important procedures, like assisted vaginal delivery (vacuum extraction) (45%), manual vacuum aspiration (45%) and evacuation and curettage (26%) (Table 3).

Most of the interviewed providers claimed that they routinely performed ANC screening procedures, like checking blood pressure, anemia, fetal heartbeat, malaria and HIV. However, only two-fifths, most of them in the hospitals, performed VDRL tests. At the time of delivery care, about 42% of the providers said that they were checking laboring mothers frequently according to the recommended standard and only 24% of them were using partograph consistently. Many providers (44%) never introduced themselves to their clients. Nonetheless, they routinely performed other procedures, like protecting privacy, explaining procedures, informing about the progress of labor and possible outcomes, as well as comforting the laboring mother. The providers did most of the important procedures and counseling at the time of postpartum care but only 68% of them did

Table 2 Important service components received by women during their ANC visit and delivery care by types of skilled attendants, North Gondar, 2012

Types of services	*Service users by qualification of their provider							
	Doctor		Health officer		Midwife/Nurse		Total	
	Yes	%	Yes	%	Yes	%	Yes	%
Services received by women during their ANC visits by a skilled attendant								
Medical history evaluated	19	82.6	19	86.4	425	86.2	463	86.1
Blood pressure measured	19	82.6	18	81.8	390	79.1	427	79.4
Weight measured	18	78.3	20	90.9	375	76.1	413	76.8
Blood sample taken	17	73.9	19	86.4	349	70.8	385	71.6
Urine sample taken	9	39.1	11	50.0	168	34.1	188	34.9
TT immunization provided	9	39.1	10	45.5	223	44.8	242	45.0
Anti malaria drugs provided	9	39.1	10	45.5	211	42.8	230	42.8
Iron/folic acid provided	15	65.2	15	68.2	315	63.9	345	64.1
Expected due date told	10	43.5	12	54.5	244	49.5	266	49.4
Nutrition advise provided	16	69.6	16	72.7	302	61.3	334	62.1
Fetal growth updated	10	43.5	12	54.5	292	59.2	314	58.4
Birth preparedness discussed	11	47.8	11	50.0	250	50.7	272	50.6
Needed materials for delivery discussed	9	39.1	12	54.5	242	49.1	263	48.9
Place of birth discussed	15	65.2	15	68.2	300	60.9	330	61.3
Advised to go health facility at time of birth	16	69.6	14	63.6	304	61.7	334	62.1
Saving funds discussed	7	30.4	12	54.5	224	45.4	243	45.2
Discussion on danger signs	9	39.1	14	63.6	258	52.3	281	52.2
Discussions on complications during delivery or postpartum	11	47.8	12	54.5	254	51.5	277	51.5
Discussed to go Health facility at time of complication	15	65.2	14	63.6	254	51.5	283	52.6
Discussed to prepare blood donor	9	39.1	10	45.5	183	37.1	202	37.5
Discussed on HIV testing	17	73.9	19	86.4	348	70.6	384	71.4
Discussed about PMTCT	13	56.5	17	77.3	347	70.4	377	70.1
Discussed about other STIs	8	34.8	8	36.4	233	47.3	249	46.3
Total	23	100	22	100	493	100	538	100
Services received by women during their delivery care by a skilled attendant								
General health assessment	28	80.0	20	87.0	151	87.3	199	86.1
Blood pressure & other vital signs	29	82.9	17	73.9	138	79.8	184	79.7
Per vaginal examination	28	80.0	17	73.9	140	80.9	185	80.1
Abdominal examination	31	88.6	21	91.3	158	91.3	210	90.9
Auscultation of fetal heart beat	31	88.6	21	91.3	153	88.4	205	88.7
Control bleeding by drugs	28	80.0	22	95.7	134	77.5	184	79.7
Information on progress of labor	28	80.0	17	73.9	136	78.6	181	78.4
Keep comfort of mother	29	82.9	20	87.0	132	76.3	181	78.4
Give care for the baby	26	74.3	17	73.9	124	71.7	167	72.3
Measure and record baby weight	18	51.4	15	65.2	121	69.9	154	66.7
Give vaccine for baby	27	77.1	14	60.9	118	68.2	159	68.8
Advise about breast feeding	27	77.1	17	73.9	137	79.2	181	78.4
Advise on infant care	21	60.0	12	52.2	94	54.9	127	55.0
Total	35	100	23	100	173	100	231	100

*Number of service users who said "Yes" during the interview and percentage within type of their provider was calculated.

Table 3 Number and percent of skilled providers having training or on-the-job experience for different types of procedures, North Gondar, 2012

Type of procedures	Qualification of provider					
	Health officer (n = 9)		Nurse/midwife (n = 29)		Total (n = 38)	
	n	%	n	%	n	%
ANC risk screening	8	88.9	26	89.7	34	89.5
Partograph utilization	7	77.8	23	79.3	30	78.9
IV infusion	9	100	28	96.6	37	97.4
Speculum examination	7	77.8	15	51.7	22	57.9
Bimanual examination	8	88.9	19	65.5	27	71.1
Compress uterus	7	77.8	20	69.0	27	71.1
External version	1	11.1	4	13.8	5	13.2
Internal version	0	0	3	10.3	3	7.9
Episiotomy	9	100	24	82.8	33	86.8
Repairing cervical laceration	0	0	5	17.2	5	13.2
Repairing vaginal tears	8	88.9	23	79.3	31	81.6
Repairing third/fourth degree tear	1	11.1	11	37.9	12	31.6
Active management of third stage	9	100	28	96.6	37	97.4
Manual removal of placenta	9	100	26	89.7	35	92.1
Assisted vaginal delivery (Vacuum extraction)	6	66.7	11	37.9	17	44.7
Manual vacuum aspiration	6	66.7	11	37.9	17	44.7
Evacuation and curettage	5	55.6	5	17.2	10	26.3

vaginal examination. Moreover, many providers reported that they had the skills to manage common obstetric complications, like preeclampsia (68%), severe bleeding (95%), retained placenta (97%), and post-abortion complications (68%) (Table 4).

Discussion

The study showed that maternity and related services, including antenatal and delivery care were available in most of the visited facilities. However, the majority of the facilities were not fully functioning for emergency obstetric care (EmOC) according to their level. In health centers (basic EmOC facilities), parenteral anticonvulsants and assisted vaginal delivery were often missing. In the hospitals, cesarean section and blood transfusion were not available. Evidences showed that these functions were commonly unavailable in many other areas [9,20]. Only one hospital met the criteria for comprehensive EmOC (performed cesarean section). This hospital is serving about three million people of the zone and the surrounding areas. It has been recommended that for every 500,000 population at least one comprehensive EmOC facility is required [7]. According to this standard, more (about six) facilities fulfilling the signal functions of comprehensive EmOC are needed. The finding implies that many mothers living in distant (>100 km) districts were obliged to travel long distance to get a functional facility at the time of complications.

The findings also indicated that many pregnant women who developed obstetric complications were not benefiting from their care.

Understanding how facilities are actually functioning is more useful than how they are supposed to function. Functioning obstetric facility means performing the essential services for normal situations and performing each signal functions for complications, and these services are available 24 hours a day and 7 days a week. Such functions require enabling environment like facilities and skilled professionals. In many of the visited facilities, important pieces of equipment were either missing or not functional. Most of the health centers also lacked important laboratory tests such as VDRL, hemoglobin, urine protein, and cross match. The absence of such tests has a clear effect on screening services during maternity care. This was a common challenge identified by other studies [21]. Moreover, many of the interviewed midlevel providers had no adequate training on important procedures, like assisted vaginal delivery (vacuum extraction), manual vacuum aspiration or evacuation and curettage. The use of partograph to monitor labor progress helps to take life saving action in a timely manner. However, few providers used partograph consistently. In addition, about one-third had no skill to manage preeclampsia and post-abortion complications. Training deficiencies and skill retention problems were among the major bottlenecks

Table 4 Reports of skilled care providers in the past three months performing the following procedures to women who present for maternity care, North Gondar, 2012

Types of services	Qualification of provider					
	Health officer (n = 9)		Nurse/midwife (n = 29)		Total (n = 38)	
	n	%	n	%	n	%
Routinely perform the following steps/check-up to women who present for antenatal care						
Take medical history	9	100	29	100	38	100
Check BP	9	100	29	100	38	100
Check anemia	9	100	29	100	38	100
Check fetal heart beat	9	100	29	100	38	100
Provide iron/folic acid supplement	8	88.9	27	93.1	35	92.1
Check malaria	9	100	28	96.6	37	97.4
Test proteinuria	7	77.8	20	69.0	27	71.1
Test syphilis	4	44.4	11	37.9	15	39.5
Counsel on self care	9	100	27	93.1	36	94.7
Counsel on delivery plan	9	100	29	100	38	100
Discuss nutrition	9	100	29	100	38	100
Tell due date	9	100	29	100	38	100
Discuss funds for expense	6	66.7	26	89.7	32	84.2
Discuss on transport	9	100	23	79.3	32	84.2
Discuss on blood donors	4	44.4	18	62.1	22	57.9
Discuss VCT	9	100	27	93.1	36	94.7
Discuss PMTCT	9	100	26	89.7	35	92.1
Routinely perform the following at the time of delivery care						
Checking laboring mother frequently according to the recommended standard	5	55.6	11	37.9	16	42.1
Partograph use at least once	5	55.6	14	48.3	19	50.0
Partograph use almost always	4	44.4	5	17.2	9	23.7
Introducing for client	4	44.4	18	62.1	22	57.9
Allow family to enter	9	100	25	86.2	34	89.5
Protecting privacy by screen/clothes	9	100	28	96.6	37	97.4
Explain procedures	8	88.9	27	93.1	35	92.1
Tell the progress of labor	9	100	28	96.6	37	97.4
Tell about possible outcomes	8	88.9	26	89.7	34	89.5
Keep comfort of laboring mother	9	100	29	100	38	100
Advise to have postpartum care (1 st wk)	6	66.7	15	51.7	21	55.3
Routinely perform the following at the time of postpartum care						
Abdominal examination	9	100	24	82.8	33	86.8
Vaginal examination	8	88.9	18	62.1	26	68.4
Checking BP	9	100	29	100	38	100
Assessing abnormal bleeding	9	100	29	100	38	100
Inspection of lochia	9	100	26	89.7	35	92.1
Discussing FP	9	100	29	100	38	100
Advise BF	9	100	29	100	38	100
Checking baby	9	100	27	93.1	36	94.7

Table 4 Reports of skilled care providers in the past three months performing the following procedures to women who present for maternity care, North Gondar, 2012 (Continued)

Management of selected complications						
Preclampsia	8	88.9	18	62.1	26	68.4
Severe bleeding	9	100	27	93.1	36	94.7
Retained placenta	9	100	28	96.6	37	97.4
Post abortion care	7	77.8	19	65.5	26	68.4

to have quality maternal care in many developing countries [11,22].

Providing incomplete (poor quality) maternal service had damaging effect on health-seeking behavior of mothers. The linked data analysis, as continuation of this study, indicated that utilization of skilled maternal care by individual woman depends on the joint effect of individual, household, communal and facility characteristics. Our analysis indicated that the presence of all the six signal functions in the nearby basic essential obstetric care facility (health center) positively contributed to the utilization of all indicators of skilled maternal services, and its effect was significant on skilled attendance rate [23].

According to the interview with mothers who received antenatal care from skilled providers, most of their service was at health centers by nurses or midwives. They rarely used doctors or specialists. After criticisms on the traditional ANC (the risk approach), the new approach that is focused antenatal care emphasizes the quality of service. In this study, the implementations of the important components of ANC services were incomplete. Many mothers did not receive various antenatal screening services. Tetanus immunization, iron supplementation, counseling and advice on nutrition, birth preparedness and readiness for possible complication were lower than expected. The identified gap in all areas of service components indicated that the current antenatal care service could be challenged to achieve the goal of focused ANC.

Like the ANC, many women who had delivery care by a skilled attendant did not receive important services. To more than 20% of the mothers' services, like blood pressure measurement, information on labor progress, and drugs for preventing bleeding were not provided. For more than 30% of the mothers, baby weight was not measured and vaccine was not provided. Providers also paid little attention to counseling and advice on different types of maternal and childcare. In this regard, the poor skills of providers may be the main causes of the unsatisfactory services. In many developing countries, competency and skill retention of providers are the major concerns for skilled birth attendance [12,24].

This study has had certain limitations. During the interview, for example, women faced difficulties to differentiate types of skilled providers. To minimize the

problem, data collectors did further clarifications by collecting information on types of providers from health institutions that gave the services. Because of the cross-sectional design of the study, recall and interviewer bias were also potential limitations. However, numerous scientific procedures were employed to minimize the possible effects. To reduce the recall bias, for instance, only women who gave birth in the last one year were included.

In conclusion, maternity services including antenatal and delivery care by a skilled provider were available in most of the visited facilities. However, components of both the routine and emergency maternity care services were incomplete. The majority of the facilities were not fully functioning for EmOC according to their level. The implementations of the important components of ANC and delivery services were incomplete and thus, many mothers did not receive various components of the services. The findings suggested that providing incomplete (poor quality) maternal service is the country's major challenge to achieve the MDG target of reducing maternal mortality. Improving the functional capacity of health facilities for the delivery of routine maternity and EmOC services are needed. According to evidence of other countries, it will be good to focus on interventions, like renovations and upgrading facilities, provision of essential equipment, and on-job training of staff [18,25].

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

All authors contributed equally during the process of proposal development. AG and AW participated in data collection and analysis. AG prepared the draft. Then AW and MF revised drafts of the paper. All authors read and approved the final manuscript.

Acknowledgements

We are very grateful to Addis Ababa University for the approval of the ethical clearance and its technical and financial support. We would like to thank all of the study participants including facility managers, health care providers, and clients for their commitment in responding to our interviews and to our data collectors for their extensive devotion at fieldwork.

Author details

¹Department of Reproductive Health, Institute of Public Health, University of Gondar, Gondar, Ethiopia. ²Department of Preventive Medicine, School of Public Health, Addis Ababa University, Addis Ababa, Ethiopia. ³Department of Reproductive Health and Health Service Management, School of Public Health, Addis Ababa University, Addis Ababa, Ethiopia.

Received: 17 February 2013 Accepted: 20 August 2013
Published: 23 August 2013

References

1. Ethiopia CSA, ICFInternational: *Ethiopia demographic and health survey 2011*. Maryland, USA: Addis Ababa, Ethiopia and Calverton; 2012.
2. Gage AJ: **Barriers to the utilization of maternal health care in rural Mali.** *Soc Sci Med* (1982) 2007, **65**(8):1666–1682.
3. Tlebere P, Jackson D, Loveday M, Matizirofa L, Mbombo N, Doherty T, Wigton A, Treger L, Chopra M: **Community-based situation analysis of maternal and neonatal care in south Africa to explore factors that impact utilization of maternal health services.** *J Midwifery Wom Health* 2007, **52**(4):342–350.
4. Tsui A, Ukwuani F, Guilkey D, Angeles G: **A comparative multi-level analysis of health program effects on individual use of reproductive and sexual health services.** *MEASURE Evaluation Bulletin* 2003, **6**:1–12.
5. Gabrys S, Cousens S, Cox J, Campbell OMR: **The influence of distance and level of care on delivery place in rural Zambia: a study of linked national data in a geographic information system.** *PLoS Med* 2011, **8**(1):e1000394.
6. Paxton A, Bailey P, Lobis S, Fry D: **Global patterns in availability of emergency obstetric care.** *Int J Gynaecol Obstet: the official organ of the International Federation of Gynaecology and Obstetrics* 2006, **93**(3):300–307.
7. World Health Organization, UNICEF, UNFPA and AMDD: *Monitoring Emergency Obstetric Care: A Handbook*. WHO, UNICEF, UNFPA and AMDD; 2009.
8. MOH, Ethiopia: *Health Sector Development Programme IV*. Addis Ababa: MOH; 2011.
9. Bailey P, Paxton A, Lobis S, Fry D: **The availability of life-saving obstetric services in developing countries: an in-depth look at the signal functions for emergency obstetric care.** *Int J Gynaecol Obstet: the official organ of the International Federation of Gynaecology and Obstetrics* 2006, **93**(3):285–291.
10. Rose M, Abderrahim N, Stanton C, Helsel D: *Maternity care: A comparative report on the availability and use of maternity services*, MEASURE Evaluation Technical Report Series; 2001. No.9.
11. Harvey SA, Ayabaca P, Bucagu M, Djibrina S, Edson WN, Gbangbade S, McCaw-Binns A, Burkhalter BR: **Skilled birth attendant competence: an initial assessment in four countries, and implications for the safe motherhood movement.** *Int J Gynecol Obstet* 2004, **87**(2):203–210.
12. Harvey SA, Blandón YCW, McCaw-Binns A, Sandino I, Urbina L, Rodríguez C, Gómez I, Ayabaca P, Djibrinaf S, group tNmanhqi: **Are skilled birth attendants really skilled? A measurement method, some disturbing results and a potential way forward.** *Bull World Health Organ* 2007, **85**:783–790.
13. Olsen BE, Hinderaker SG, Bergsjø P, Lie RT, Olsen OHE, Gasheka P, Kvåle G: **Causes and characteristics of maternal deaths in rural northern Tanzania.** *Acta Obstet Gynecol Scand* 2002, **81**(12):1101–1109.
14. Kerber KJ, Graft-Johnson JE, Bhutta ZA, Okong P, Starrs A, Lawn JE: **Continuum of care for maternal, newborn, and child health: from slogan to service delivery.** *Lancet* 2007, **370**:1358–1369.
15. WHO: *A Global Review of the Key Interventions Related to Reproductive, Maternal, Newborn and Child Health (RMNCH)*, Interventions, commodities, and guidelines for Reproductive, Maternal, Newborn and Child Health. Geneva, Switzerland: WHO; 2011.
16. Turner AG, Angeles G, Tsui AO, Wilkinson M, Magnani R: *Sampling Manual for Facility Surveys for Population, Maternal Health, Child Health and STD Programs in Developing Countries*. Carolina Population Center, University of North Carolina at Chapel Hill: MEASURE Evaluation; 2001.
17. FDRE PCCo: *Statistical Report of the 2007 Population and Housing Census of Ethiopia Results*. Addis Ababa: UNFPA, Population Census Commission; 2008.
18. Carlough M, McCall M: **Skilled birth attendance: what does it mean and how can it be measured? A clinical skills assessment of maternal and child health workers in Nepal.** *Int J Gynaecol Obstet: the official organ of the International Federation of Gynaecology and Obstetrics* 2005, **89**(2):200–208.
19. WHO: *Making pregnancy safer: The critical role of the skilled attendant*, A joint statement by WHO, ICM and FIGO. Department of Reproductive Health and Research. Geneva: WHO; 2004 [http://www.who.int/maternal_child_adolescent/documents/9241591692/en/index.html]
20. Ameh C, Msuya S, Hofman J, Raven J, Mathai M, van den Broek N: **Status of emergency obstetric care in six developing countries five years before the MDG targets for maternal and newborn health.** *PLoS one* 2012, **7**(12):e49938.
21. Jahn A, Dar lang M, Shah U, Diesfeldt HJ: **Maternity care in rural Nepal: a health service analysis.** *Trop Med Int Health: TM & IH* 2000, **5**(9):657–665.
22. Ith P, Dawson A, Homer C: **Quality of maternity care practices of skilled birth attendants in Cambodia.** *Int J Evid Based Healthc* 2012, **10**(1):60–67.
23. Worku AG, Yalew AW, Afework MF: **Factors affecting utilization of skilled maternal care in northwest Ethiopia: a multilevel analysis.** *BMC Int Health and Human Rights* 2013, **13**(1):20.
24. Darmstadt GL, Lee ACC, Cousens S, Sibley L, Bhutta ZA, Donnay F, Osrin D, Bang A, Kumar V, Wall SN, et al: **60 million non-facility births: who can deliver in community settings to reduce intrapartum-related deaths?** *Int J Gynecol Obstet: the official organ of the International Federation of Gynaecology and Obstetrics* 2009, **107**(Suppl 1):S89–S112.
25. Kayongo M, Butera J, Mboninyibuka D, Nyiransabimana B, Ntezimana A, Mukangamuje V: **Improving availability of EmOC services in Rwanda– CARE's experiences and lessons learned at Kabgayi referral hospital.** *Int J Gynecol Obstet: the official organ of the International Federation of Gynaecology and Obstetrics* 2006, **92**(3):291–298.

doi:10.1186/1742-4755-10-43

Cite this article as: Worku *et al.*: Availability and components of maternity services according to providers and users perspectives in North Gondar, northwest Ethiopia. *Reproductive Health* 2013 **10**:43.

Submit your next manuscript to BioMed Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit



Paper – IV

RESEARCH ARTICLE

Open Access

Factors affecting utilization of skilled maternal care in Northwest Ethiopia: a multilevel analysis

Abebaw Gebeyehu Worku^{1*}, Alemayehu Worku Yalew² and Mesganaw Fantahun Afework³

Abstract

Background: The evaluation of all potential sources of low skilled maternal care utilization is crucial for Ethiopia. Previous studies have largely disregarded the contribution of different levels. This study was planned to assess the effect of individual, communal, and health facility characteristics in the utilization of antenatal, delivery, and postnatal care by a skilled provider.

Methods: A linked facility and population-based survey was conducted over three months (January - March 2012) in twelve "kebeles" of North Gondar Zone, Amhara Region. A total of 1668 women who had births in the year preceding the survey were selected for analysis. Using a multilevel modelling, we examined the effect of cluster variation and a number of individual, communal (kebele), and facility-related variables for skilled maternal care utilization.

Result: About 32.3%, 13.8% and 6.3% of the women had the chance to get skilled providers for their antenatal, delivery and postnatal care, respectively. A significant heterogeneity was observed among clusters for each indicator of skilled maternal care utilization. At the individual level, variables related to awareness and perceptions were found to be much more relevant for skilled maternal service utilization. Preference for skilled providers and previous experience of antenatal care were consistently strong predictors of all indicators of skilled maternal health care utilizations. Birth order, maternal education, and awareness about health facilities to get skilled professionals were consistently strong predictors of skilled antenatal and delivery care use. Communal factors were relevant for both delivery and postnatal care, whereas the characteristics of a health facility were more relevant for use of skilled delivery care than other maternity services.

Conclusion: Factors operating at individual and "kebele" levels play a significant role in determining utilization of skilled maternal health services. Interventions to create better community awareness and perception about skilled providers and their care, and ensuring the seamless performance of health care facilities have been considered crucial to improve skilled maternal services in the study area. Such interventions should target underprivileged women.

Keywords: Skilled maternal care, Linked survey, Multilevel analysis

Background

In Ethiopia, maternal health has received attention for the last two decades. Currently, reducing maternal mortality is one of the goals of the Health Service Development Program of the country. Maternal and newborn health is also among the six priority areas in the reproductive health strategy [1]. Based on ecological and historical evidences observed in European and Asian countries,

health professionals with midwifery skill were considered the key factors to decrease maternal mortality. The low maternal mortality rates reported by the Netherlands, Norway, and Sweden in the early 20th century were believed to have been the result of an extensive collaboration between physicians and highly competent, locally available midwives [2]. Similarly, Malaysia, Sri Lanka and Thailand halved their maternal mortality ratios within ten years by increasing the number of midwives in the 1950s and 1960s [3].

* Correspondence: abebawgebeyehu@yahoo.com

¹Department of Reproductive Health, Institute of Public Health, University of Gondar, Gondar, Ethiopia

Full list of author information is available at the end of the article

At the moment, many countries including Ethiopia are working to meet the WHO recommendation of having skilled attendance for all births [4]. According to the recent 2011 Ethiopian Demographic and Health Survey (EDHS) report, only 34%, 10% and 6% of the women had Antenatal Care (ANC), delivery, and postnatal care by skilled providers respectively [5]. Maternal mortality has also not changed from its previous level where maternal mortality ratio was 673 per 100,000 live births in the 2005 EDHS report [6], and it was 676 per 100,000 live births in the 2011 EDHS report [5].

Skilled maternal care refers to maternity services (antenatal, delivery, and postnatal care) by a health professional with midwifery skill that can be provided at different levels (home, health centers or hospitals). In order to provide such skilled maternal care, we need to have an enabling environment and skilled providers. An enabling environment include; functional health facilities and a reliable referral system to link the different levels, awareness and readiness of the community for utilizing skilled care as well as supporting the policy and political commitment [4]. Health professionals who have been educated and trained to proficiency in the skills needed to manage normal pregnancies, childbirth and the immediate postnatal period, and in the identification, management or referral of complications are categorized as skilled care providers [7,8]. In the study, skilled providers include midwives, nurses, health officers and doctors.

There are several factors influencing skilled maternal health care utilization within the dimensions of skilled maternal care definition. The factors operate their impact at different levels. Review of the global literature indicates that these factors can be classified as 1) individual and household level 2) communal and health facility level and 3) national or state level.

At the individual and household level maternal education, parity, residence, awareness and perceptions related to the risks of pregnancy and skilled maternal services, previous experiences, women's decision-making power, and household wealth are some of the known variables.

At the health facility level the availability, readiness, and quality of services as well as the type, competence and caring behavior of providers are very important for maternal services. However, in many developing countries health facilities are not performing the expected functions according to their level [9]. Furthermore, there is a huge gap in the competence of health workers categorized as skilled providers [8,10]. Pre-service training is also not a guarantee. It is recommended that maternity care providers need to receive refresher training or updates in midwifery every three to five years [11].

Some studies identified community and state level factors using multilevel analysis. A study in Vietnam reported that the presence of low education coverage,

geographical isolation, and high poverty rate in the community reduce access to skilled maternal services [12]. Evidences from Nigeria also showed that urban residence and the availability of community media significantly increased maternal service utilization [13]. At the policy level, resource investments in the main system components of health programs raised the level of maternal service utilizations [14]. The significant effect of government health expenditure in improving the utilization of skilled maternal service was also observed in other studies [15,16].

Studies in Ethiopia have serious limitations in evaluating the determinants of skilled maternal care utilization. The studies provided evidence based on the evaluation of either user or facility related determinants. Addressing only one of these categories is likely to present a very incomplete picture of the evaluation of determinants affecting maternal service utilization. In addition, the nesting effects of different levels are usually not controlled during analysis. Therefore, appropriate methodology is required for a more comprehensive and accurate analysis. As a result, all potential sources of poor skilled maternal care utilization can be evaluated to design maternal service strategies at different levels. This study was planned to assess the effect of individual, household, communal and health facility characteristics in the utilization of antenatal, delivery, and postnatal care by a skilled provider.

Methods

Study design and area

A linked facility and population-based survey i.e. a facility survey linked to population based survey sample areas was conducted over three months (January - March 2012) in North Gondar Zone. The two surveys were conducted concurrently to analyze all potential factors operating at different levels (individual and community levels) simultaneously. The use of linked survey is also considered as stronger approach to analyze causality in non-experimental studies [17].

North Gondar is one of the 11 zones of the Amhara Regional State located in northwest Ethiopia. It has 22 districts. The zonal center, Gondar town, is located 735 kilometer from Addis Ababa. At the time of the study, more than three million individuals were living in the zone. About 84.1% of its inhabitants were rural dwellers [18]. North Gondar, the largest zone of the region, is known for its difficult topography.

Study population and sampling

Women who had births in the year preceding the survey were included in the study. A multistage sampling technique was applied to select the study population. Initially, six districts of the zone namely Dembia, Lay Armachiho, West Belessa, Metema, Debark and Dabat

were selected. Then a total of twelve clusters or kebeles (two kebeles per district) were selected randomly. The 'kebeles' are the lowest administrative units with a size of about 1000 households (5000 population). All eligible women found in the selected cluster were studied. Accordingly, 1730 women were identified for interview.

The adequacy of the sample size was checked based on differences in frequency of important exposure variables among users and non-users at the time of proposal development. Epi Info StatCalc software was used for the calculations by assuming a 95% confidence level and 80% power with a 1:3 ratio of users and non-users.

In order to have a linked data, basic essential obstetric care facilities (health centers) utilized by the kebele population were selected for the facility based survey. For each cluster (kebele), one basic essential obstetric care facility was studied and linked.

Data collection

All health facilities serving the study population were assessed with regard to the number, training and competency of obstetric staff; services offered; signal functions; physical infrastructure; and availability, adequacy and functional status of supplies and other essential equipment for maternal services. The basic signal functions include parenteral antibiotics, anticonvulsants and oxytocics, and the procedures for manual removal of the placenta, removal of retained uterine products, and assisted vaginal delivery. During the population based survey information about kebele (cluster) characteristics, socio-demographic characteristics, awareness, perceptions and experiences related to the women's use of skilled maternal care services were collected.

For the population based survey, a total of 36 qualified data collectors and supervisors (2 data collectors and 1 supervisor for each kebele) were trained and deployed. The interviews were conducted using the local language (Amharic) after the questionnaire was pretested for cultural appropriateness and clarity. For the facility-based survey, 14 health professionals who had work experience were recruited.

Data analysis and modeling

After appropriate coding, the data were entered using Epi Info version 3.5.3 software and exported to STATA version 11 software for analysis. Uses of maternal services (antenatal, delivery and postnatal care) by skilled providers were the dependent variables. The predictors of each of these indicators were assessed separately using a multilevel binary logistic regression.

The rationales for using a multilevel modeling were the following. Firstly, the utilization patterns of maternal health services are influenced by the characteristics of different levels (individuals, community, and health

facilities). Analyzing variables from different levels at one single common level using the standard binary logistic regression model leads to bias (loss of power or Type I error). This approach also suffers from a problem of analysis at the inappropriate level (atomistic or ecological fallacy). Multilevel models allow us to consider the individual level and the group level in the same analysis, rather than having to choose one or the other. Secondly, due to the multistage cluster sampling procedure, individual women were nested within kebeles; hence, the likelihood of women seeking maternal health services is likely to be correlated to the kebele members. The assumption of independence among individuals within the same cluster and the assumption of equal variance across clusters are violated in the case of nested data. Hence, the multilevel analysis is the appropriate method for such cases.

Using a two-level binary logistic regression modelling, we examined the effect of a number of individual, community, and facility variables. During analysis, the characteristics of women and household were taken as individual level (level-1), and characteristics of the kebeles (including characteristics of their health centers) were treated as level-2 (Table 1). For each of the three dependent variables, we estimated two models: intercept-only model; an empty model that contains no covariates, and a full model that included individual and kebele level variables. The full model was a random slopes model for ANC and a random intercept model for delivery and postnatal care.

Assume the binary responses Y_{ij} depend on individual-level explanatory variable X_{ij} and group-level explanatory variable Z_j . If deviation from the average intercept and slope due to cluster (level-2) effect are represented by u_{0j} and u_{1j} , the two models are given in the following way.

The intercept-only model = **Logit** $p_{ij} = \gamma_{00} + u_{0j}$ and the full model = **Logit** $(p_{ij}) = \gamma_{00} + \gamma_{01} Z_j + \gamma_{10} X_{ij} + u_{0j} + u_{1j} X_{ij}$. The intercept γ_{00} and slopes γ_{01} and γ_{10} are fixed effects whereas u_{0j} and u_{1j} are random effects of level-2.

The intercept-only model allows us to evaluate the extent of the cluster variation influencing maternal service utilization of women. The intra-class correlation coefficient (Rho) was calculated to evaluate whether the variation in the scores is primarily within or between clusters. In logistic distribution, level-1 residual variance, ϵ_{ij} , is standardized and fixed with a mean of zero and variance = $\pi^2/3$. Therefore, for a two-level logistic random intercept model with an intercept variance of σ^2_{u0} , the intra-class correlation coefficient (Rho) is given by ' $\rho = \frac{\sigma^2_{u0}}{\sigma^2_{u0} + \pi^2/3}$ '.

Ethical considerations

Before the commencement of the study, ethical clearance was obtained from the Institutional Review Board of the

Table 1 Description and measurement of variables included in the models, North Gondar, 2012

Variables	Descriptions	Measurements
Dependent variables		
ANC, Birth attendance and PNC by a skilled provider (three dependent variables)	Women who received ANC at least once from a skilled provider, delivery attended by a skilled provider and Women who received PNC at least once from a skilled provider	For each indicator, 'Yes' responses are coded as '1' otherwise as '0'
Level-1 predictor variables	Individual and household characteristics	
Birth order	Birth order of women's most recent birth (index birth)	It is divided in to four categories: first birth, 2nd- 3rd, 4th-5th and above 5th
Maternal and husband educational status	Highest level of education attained by the respondent (mother) and her husband	For each variable, it is categorized in to three: illiterate, primary and secondary and above secondary
Wealth quintile	Household wealth status is computed by principal component analysis from ten variables (presence of own farmland, own toilet facility, bank account, mobile phone, electricity, roof of house with corrugated iron sheet, number of cows/oxen, horses/ mules/donkeys goats/sheep and chicken)	The wealth status is categorized in to five groups and ranked from poorest to wealthiest quintile.
Awareness on risk of pregnancy	Awareness of women on risk of pregnancy	When women mentioned at least one major risk factor, the value is '1' if not it is '0'
Health professionals preferred by women	Women prefer health professionals for their maternity care	Yes' responses are coded as '1' and no responses as '0'.
Awareness on places to get skilled providers	Women know appropriate health facilities to get skilled providers	When appropriate facilities are known, the value is '1' if not it is '0'.
Pregnancy wantedness	Pregnancy wanted or not	Pregnancy wanted or miss-timed coded as '1' and unwanted coded as '0'
ANC in previous pregnancy	Presence of at least one ANC visit in previous pregnancies	Yes' responses are coded as '1' and no responses as '0'.
Agreed on postnatal check up	Women agreed on the need of postnatal check up after normal delivery	When women agreed, the value is '1' if not it is '0'.
Level-2 predictor variables	Communal (kebele) characteristics	
Source of income	The kebele population main source of income	It is categorized in to two: Farming and mixed (farming and trading)
Self sustained	Presence of enough production for feeding the population	Yes' responses are coded as '1' and no responses as '0'.
Average distance	Average distance (in Kilometer) of villages in each kebele to the nearest health center	Supervisors estimated the distances of villages from health centers. The average values were calculated and rounded to one decimal place.
	Health facility characteristics	
Presence of signal functions	Presence of all the six signal functions in basic essential obstetric care facilities (health centers)	If all signal functions are present, the value is labeled as '1' if one or more are missing, the value is labeled as '0'
Duty service	Maternity service for 24 hrs and 7 days	Yes' responses are coded as '1' and no responses as '0'.
Availability of obstetric guidelines	Obstetric guidelines available for reference by staff at all times	Yes' responses are coded as '1' and no responses as '0'.
Payment requirements	Maternity clients required to purchase/ provide supplies/drugs at time of delivery	Yes' responses are coded as '1' and no responses as '0'.

Table 1 Description and measurement of variables included in the models, North Gondar, 2012 (Continued)

Overall infrastructure	Infrastructures of the health facility (examination and delivery rooms, refrigerator, water source, power supply, toilet facilities, drainage system. . .)	Based on records of observation, the infrastructure of the health facility is categorized as not satisfactory (1) and satisfactory (2).
Basic equipments	Presence of basic equipments (BP apparatus, stethoscope, fetal stethoscope, adult and baby weighing scales, delivery and episiotomy sets, sterilizers. . .)	Based on records of observation, the variable is categorized as not satisfactory (1) and satisfactory (2).

College of Health Sciences, Addis Ababa University. Then permission letters from officials of districts and health institutions were processed before starting data collection. During data collection, study participants were asked for consent and were signed written agreements on consent forms. They were informed to interrupt the interview on desire. To ensure confidentiality, names were not used, instead code numbers were assigned to depict the results and the questionnaires were kept locked.

Results

A total of 1730 women were interviewed. For analysis, 1668 women were considered because some 62 copies of questionnaire were excluded during the data cleaning process due to incompleteness and inconsistent values. Majority of the study subjects was Orthodox Christians (93.7%), Amhara by ethnicity (92.7%) and currently married (92.7%). At the time of their last birth, about 73.3% were between 20–34 years, 5.5% were teenagers (less than 20 years) and 21.2% were elderly gravid (35 years and above). The mean age was 28.2 ± 6.6 years, with a range of 16–51 years. The majority of the mothers (71%) and their husbands (63.4%) had no formal education (Table 2).

About 32.3% (95% CI, 30.0%, 34.5%), 13.8% (95% CI, 12.2%, 15.5%) and 6.3% (95% CI, 5.1% to 7.5%) of women used antenatal, delivery and postnatal care by skilled providers, respectively. The bivariate analysis indicated that use of all indicators of skilled maternal services appeared to increase significantly with educational status of women and their husbands. Moreover, higher wealth quintiles, awareness of risk of pregnancy, preference for skilled provider, awareness about health facilities to get skilled professionals and previous experience of antenatal care showed a significant and positive association while higher birth order, and unwanted pregnancy showed a negative association in all maternal service indicators (Table 2).

The multilevel analysis was started from the intercept-only model to test the null hypothesis that there is no variation in maternal health services utilization between clusters (kebeles) and to decide in evaluation of the random effects at the community level. The results presented in Table 3 indicated that considerable heterogeneity between

kebeles was observed for each indicator of skilled maternal care utilization. In all the three indicators, use of service is clustered significantly by kebele. The intra-class correlation in the empty model for antenatal, delivery and postnatal care by skilled provider indicated that 31%, 12%, and 25% of the total variance in use of the services was attributable to the differences across kebeles (Table 3).

Antenatal care by a skilled provider

Maternal education, preference for skilled provider, awareness about health facilities to get skilled professionals and previous experience of antenatal care were strong individual level predictors of the recent antenatal care by a skilled provider. The predictor 'birth order' indicates that women tend to use antenatal care by a skilled provider if their birth is their first time, and a small but significant difference was observed compared with those women with four or five births. The odds ratio indicates that use of antenatal services initially decreases with birth order up to the third category and increases thereafter.

Antenatal care by a skilled provider increases steadily with education so that women with secondary and above education were 68% more likely to use service as their counterparts with no education. Women who have had at least one antenatal care in previous pregnancies were about three times more likely to use skilled antenatal care for their recent pregnancy. Similarly, women who preferred health professionals for their maternity care and have awareness about health facilities to get skilled professionals significantly use skilled antenatal care compared with their counterparts.

The study further showed that communal level variables included in the model were not significant predictors of skilled antenatal services utilization.

Finally, a substantial proportion of the between kebele variance was explained by this model given the between kebele variation has been reduced from 1.52 to 0.76, a 50% reduction in unexplained variance between kebele ANC utilization. However, community level random effects are significant; the residual intra-class correlation is still appreciably large, indicating that even after controlling for individual, communal (kebele) level factors, there is still a considerable clustering of antenatal service utilization

Table 2 Utilization of skilled maternal health services using selected individual level characteristics, North Gondar, 2012

Characteristics		n	Number (percent) of women reporting skilled provider for:		
			ANC	Delivery care	PNC
Birth order	1	335	132 (39.4)	77 (23.0)	31 (9.3)
	2-3	657	215 (32.7)	85 (12.9)	47 (7.2)
	4-5	439	116 (26.4)	43 (9.8)	17 (3.9)
	6+	237	75 (31.6)	26 (11.0)	10 (4.2)
Mother's education	No education	1183	339 (28.7)	129 (10.9)	56 (4.7)
	Primary	327	117 (35.8)	49 (15.0)	24 (7.3)
	Secondary and above	158	82 (51.9)	53 (33.5)	25 (15.8)
Husband education	No education	1057	286 (27.1)	116 (11.0)	50 (4.7)
	Primary	430	172 (40.0)	62 (14.4)	33 (7.7)
	Secondary and above	181	80 (44.2)	53 (29.3)	22 (12.2)
Wealth quintile	Lowest	331	81 (24.5)	37 (11.2)	13(3.9)
	Second	340	107 (31.5)	43 (12.6)	15(4.4)
	Middle	306	112 (36.6)	44 (14.4)	30(9.8)
	Fourth	357	128 (35.9)	60 (16.8)	24(6.7)
	Highest	334	110 (32.9)	47 (14.1)	23(6.9)
Women have awareness on risk of pregnancy	No	522	90 (17.2)	52 (10.0)	13 (2.5)
	Yes	1146	448 (39.1)	179 (15.6)	92 (8.0)
Women preferred health professionals for the care	No	713	142 (19.9)	40 (5.6)	15 (2.1)
	Yes	955	396 (41.5)	191 (20.0)	90 (9.4)
Women have awareness on places to get skilled providers	No	341	45 (13.2)	14 (4.1)	7 (2.1)
	Yes	1327	493 (37.2)	217(16.4)	98 (7.4)
Pregnancy wantedness	Wanted/mistimed	1511	495 (32.8)	214 (14.2)	96 (6.4)
	Unwanted	157	43 (27.4)	17 (10.8)	9 (5.7)
ANC in previous pregnancy	No	957	200 (20.9)	107 (11.2)	42 (4.4)
	Yes	711	338 (47.5)	124 (17.4)	63 (8.9)
Women agree on planning health institutions as delivery place	No	432		38 (8.8)	
	Yes	1236		193 (15.6)	
ANC for this pregnancy by a skilled provider	No	1130		103 (9.1)	56 (5.0)
	Yes	538		128 (23.8)	49 (9.1)
Women agree to have PNC after normal delivery	No	767			26 (3.4)
	Yes	901			79 (8.8)
Total		1668	538 (32.3)	231 (13.8)	105 (6.3)

at the community (kebele) level. The between kebele variance of slopes indicated that the two variables, ANC in the previous pregnancies and preference for skilled providers, significantly varied across kebeles. That means, the relationships between these variables and ANC use by women were different for different kebeles (dependent on the proportion of ANC users in the kebeles) (Table 4).

Delivery care by a skilled provider

The significant individual level variables that predict use of delivery care by a skilled provider include; birth order,

maternal education, preference for skilled provider, awareness about health facilities to get skilled professionals, experience of antenatal care for previous pregnancies and skilled antenatal care for the recent pregnancy. Women who had births for the first time were more likely to use skilled birth attendance compared with any of the birth order categories, and the difference was statistically significant in all comparisons. As we observed with the use of antenatal care, skilled attendance at birth increases significantly with secondary education. Women having at least one antenatal care in previous pregnancies or skilled

Table 3 Parameter coefficients of the intercept-only model in using skilled maternal care, North Gondar, 2012

	ANC by skilled provider	Birth attendance by skilled provider	PNC by skilled provider
Random effects			
Level 2 variance	1.52* (0.63, 3.71)	0.45* (0.17, 1.18)	1.09* (0.35, 3.38)
Rho - Intra-class correlation	0.31	0.12	0.25
Deviance	1832	1282	735

*Significant.

antenatal care in their recent pregnancy were about two times more likely to have birth attendance by a skilled provider. Similar to the antenatal care service, women who preferred health professionals for their maternity care and have awareness about health facilities to get skilled professionals used significantly more delivery care by a skilled provider compared with their counter parts.

Three predictor variables from the second level, that is, source of income, signal function and payment requirements during delivery were significantly associated with skilled attendance at birth. Women who belonged to communities with mixed (farming and trading) source of income used skilled attendance 64% higher than those who belonged to only farming as the main source of income. The presence of all the six signal functions in the nearby basic essential obstetric care facility (health center) increased skilled attendance rate about two times compared to those health centers with at least one function is missing. By contrast, presence of payment requirements during delivery reduced utilization of skilled attendance by 47%.

The random part of this model indicated that almost all of the between kebele variance was explained by the included variables in the model. The model fitness was also improved significantly (Table 4).

Postnatal care by skilled attendant

Three predictor variables, two from the individual level and one from the communal level significantly associated with postnatal care by a skilled provider. At the individual level, women who preferred skilled provider for their maternity care, and women who had experience of at least one antenatal care for their previous pregnancies used a skilled postnatal care more likely compared with those who did not have such characters.

At the communal level, the odds of postnatal care by a skilled provider significantly increased among women belonging to communities who had mixed (farming and trading) source of income compared with those belonging to only farming as the main source of income.

Like that of the skilled attendance at birth, the random part of the model indicated that almost all of the between kebele variance in the use of skilled postnatal care was explained by the variables in the model (Table 4).

Discussion

Using a linked population and facility based survey and appropriate modeling framework, this study assessed the effect of individual, household, communal and health facility characteristics in utilization of antenatal, delivery, and postnatal care by a skilled provider. The results suggest that utilization of skilled maternal care by individual women is very low in the study area. The finding is consistent with the recent EDHS report and previous studies conducted in the surrounding area [5,19,20].

Our analysis indicates that utilization of skilled maternal care by individual women depends on the joint effect of individual, household, communal and facility characteristics. According to the intra-class correlation results, the contribution of unobserved communal level characteristics, were 31% for antenatal care, 12% for delivery care and 25% for postnatal care. In all the three intercept-only models, the contributions were significant and indicated that determining association without the control of variables at different levels would give a misleading result. This was also observed during analysis where many of the significant associations disappeared when the effect of clustering by kebele was controlled. Previous studies based on a similar analysis showed consistent findings [12,13].

At the individual level, variables related to awareness and perceptions were found to be much more relevant for skilled maternal service utilization. Women may get knowledge on the importance of skilled maternal care in different ways such as previous exposure to skilled maternal services, community based health educations, through community media or due to their better educational status. In this study, women with at least one antenatal care in previous pregnancies were significantly more likely, to use skilled maternal care for all the three indicators of their recent pregnancy. The positive effect of maternal service in the previous birth on current maternal care was observed in different studies done elsewhere [12,21,22].

Having awareness about health facilities to get skilled professionals was a significant predictor of both skilled antenatal and delivery care. The effect of awareness was also observed in community-based interventions focusing on awareness creation. For example, in Ethiopia, higher rate of household visits and awareness by health extension and community health workers were associated with

Table 4 Results of the multilevel analysis by predictors of skilled maternity care, North Gondar, 2012

Predictors		n	Adjusted odds ratio (95% CI)		
Level-1 predictor variables (Individual and household characteristics)			ANC	Delivery care	PNC
Birth order	1	335	1	1	1
	2-3	657	0.75 (0.53, 1.07)	0.60 (0.40, 0.90)	0.98 (0.56, 1.71)
	4-5	439	0.66 (0.44, 0.99)	0.51 (0.32, 0.85)	0.58 (0.28, 1.20)
	6+	237	0.79 (0.50, 1.25)	0.55 (0.31, 0.96)	0.60 (0.26, 1.38)
Mother's education	No education	1183	1	1	1
	Primary	327	1.09 (0.80, 1.50)	1.17 (0.79, 1.72)	1.31 (0.76, 2.24)
	Secondary and above	158	1.68 (1.08, 2.60)	1.94 (1.21, 3.10)	1.72 (0.86, 3.47)
Husband education	No education	1057	1	1	1
	Primary	430	1.34 (0.98, 1.82)	0.83 (0.56, 1.22)	0.83 (0.49, 1.39)
	Secondary and above	181	1.22 (0.77, 1.94)	1.27 (0.77, 2.11)	0.85 (0.43, 1.70)
Wealth quintile	Lowest	331	1	1	1
	Second	340	1.02 (0.69, 1.51)	1.08 (0.66, 1.78)	0.97 (0.44, 2.14)
	Middle	306	1.14 (0.75, 1.72)	1.24 (0.74, 2.08)	2.08 (1.01, 4.28)
	Fourth	357	1.03 (0.68, 1.56)	1.51 (0.92, 2.46)	1.35 (0.63, 2.86)
	Highest	334	0.83 (0.54, 1.27)	1.21 (0.71, 2.05)	1.44 (0.67, 3.13)
Awareness on risk of pregnancy	No	522	1	1	1
	Yes	1146	1.35 (0.96, 1.89)	1.10 (0.82, 1.75)	1.52 (0.79, 2.93)
Health professionals preferred for the care	No	713	1	1	1
	Yes	955	1.64 (1.14, 2.36)	2.29 (1.50, 3.51)	2.45 (1.31, 4.60)
Awareness on places to get skilled provider	No	341	1	1	1
	Yes	1327	1.63 (1.07, 2.49)	2.83 (1.54, 5.20)	1.48 (0.64, 3.42)
Pregnancy wantedness	Wanted/mistimed	1511	1	1	1
	Unwanted	157	0.79 (0.51, 1.22)	0.59 (0.34, 1.03)	0.67 (0.31, 1.42)
ANC in previous pregnancy	No	957	1	1	1
	Yes	711	3.39 (1.98, 5.80)	1.80 (1.31, 2.49)	1.92 (1.20, 3.08)
Skilled ANC for this pregnancy	No	1130		1	1
	Yes	538		1.90 (1.37, 2.63)	0.76 (0.48, 1.20)
Level 2 predictor variables					
Communal (kebele) characteristics					
Main source of income	Farming	1214	1	1	1
	Mixed	454	1.35 (0.47, 3.88)	1.64 (1.18, 2.28)	1.54 (1.03, 2.30)
Self sustained	No	445	1	1	1
	Yes	1223	1.29 (0.21, 8.09)		
Average distance to the nearest health center			0.83 (0.46, 1.48)	0.84 (0.69, 1.03)	0.80 (0.63, 1.02)
Health facility characteristics					
Signal functions	One or more missed	583	1	1	1
	All present	1085	1.14 (0.24, 5.51)	1.96 (1.13, 3.40)	1.16 (0.58, 2.35)
Availability of obstetric guidelines	No	900			1
	Yes	768			1.13 (0.59, 2.18)
Payment requirements during delivery	No	1252		1	
	Yes	416		0.53 (0.32, 0.88)	
Overall infrastructure	Not satisfactory	1153	1	1	1
	Satisfactory	515	1.64 (0.39, 6.92)	0.98 (0.64, 1.51)	1.51 (0.74, 3.10)

Table 4 Results of the multilevel analysis by predictors of skilled maternity care, North Gondar, 2012 (Continued)

Basic equipments	Not satisfactory	878	1	
	Satisfactory	790	1.12 (0.73, 1.72)	
Random part				
	Var (ANC in previous preg)	0.62 (0.22, 1.80)	-	-
	Var (Preference of H. professionals for the care)	0.07 (0.14, 4.05)	-	-
	Var(cons) i.e. level-2 variance	0.76 (0.41, 2.21)	5.64e-19	2.13e-18
	Rho - Intra-class correlation	0.19	Nearly 0	Nearly 0
	Deviance (G^2)	1652	1167	670

improved antenatal care use and postnatal care visits [23]. Better educational status is believed to be an important factor for better awareness and positive attitude related to maternal health service utilization. As expected, skilled maternal care during pregnancy, delivery, and postnatal period increased steadily with education. Women with secondary and above education were also significantly associated with antenatal and delivery care by a skilled provider. Previous studies support our findings [13,19,24,25].

One of the expected effects of knowledge about an issue is change on individual attitudes. Women who have confidence on skilled providers and their care tend to use maternal health services by a skilled provider. In our analysis, significantly higher utilization rate of all skilled maternal health service indicators was observed among women who perceive that health professionals are better and safer (prefer skilled providers) for their maternity care. The implications of this finding is that community based health education about the benefit of skilled maternal care by targeting women who prefer non-skilled providers as well as improving the quality of care by providers will bring a positive contribution for utilizing skilled maternal care.

The predictor birth order indicates that women tend to use skilled maternal care if their birth is the first, and its significant effect is observed in antenatal and delivery care. The variations observed in the odds ratios can be related with the risk perception of women that varies overtime. Many women (48.3%) believe the first pregnancy is risky compared with the next consecutive pregnancies. However, as the number of pregnancies exceeds a certain limit, they start to think about another risk. Because of this, many women (41.3%) believe that having too many births is risky for a woman.

Women's health seeking behavior is also influenced by the cost of maternity services and their capacity to cover the expected expenses. For instance, a substantial proportion of antenatal care users did not deliver or use postnatal care by a skilled provider. On the one hand, maternity services, especially delivery care, are expensive. Studies indicate that delivery care use among antenatal care users is highly correlated with wealth [26]. On

the other hand, delivery occurs suddenly. As a result, women have home birth by non-skilled providers due to transportation problems and lack of preparation. The positive contribution of better wealth status for all maternity service indicators and its significant contribution to postnatal care are also observed in our analysis. The study further evaluated the contribution of wealth indicators at kebele level. Women living in kebeles with mixed (farming and trading) source of income were utilizing significantly more skilled delivery and postnatal care than those living on farming only. The finding indicates that the presence of different sources of income for covering payments of transportation and other services contributed to the existence of higher rate of expensive maternal services in the communities. In this study, payment requirement at the time of delivery was an important barrier to delivery service by a skilled provider. The negative effect of the cost of maternity services and the need for reducing it was also observed in a study conducted in Tanzania. In the Tanzania study, standard maternity services were costly. For most households, maternal health care could take more than half of their annual consumption. The study further indicated that by subsidizing maternity care, women, especially those in the lowest socio-economic category would experience the greatest increase in service utilization [27]. The findings of our study and previous evidences imply that for better achievements in the utilization of skilled maternal health services, there should be mechanisms to reduce or avoid the costs of maternal services.

Another strong facility level predictor for skilled maternal care utilization was the performance of health facilities. The presence of all the six signal functions in the nearby basic essential obstetric care facility (health center) positively contributed to the utilization of all indicators of skilled maternal services, and its effect was significant on skilled attendance rate. Functioning obstetric facility means performing the essential services for normal situations and complications and these services should be available 24 hours a day and 7 days a week. The presence of all signal functions reflects better performance (quality) of a health facility. Furthermore,

the findings of this study imply that improving the quality of care and monitoring facilities to perform the expected function at their level will be one of the strategies to increase the utilization rates of maternity care by a skilled provider.

Limitations

One of the limitations of this study was that women faced difficulties to differentiate the type of skilled providers during interview. To reduce the problem, data collectors gave further clarifications by collecting information on types of providers (doctor, health officer, nurse, midwife, health extension worker or others) from health institutions that gave services. Errors may occur in knowing the categories of health professionals. However, there were no serious difficulties in categorizing service providers as skilled or non-skilled, so it did not affect the interpretation of results. The potential limitations expected during analysis of determinant factors were minimized.

Conclusions

Factors operating at individual and communal (kebele) levels play a significant role in determining the utilization of skilled maternal health services, so controlling unexplained variations of the higher level is very important for preventing misleading associations. At the individual level, health-seeking behavior of a woman was more dependent on her awareness and perception on skilled provider or care. Included communal factors were relevant for both delivery and PNC. Health facility characteristics, including performance (functionality) and cost of service were more important for use of skilled delivery care than other maternity services. Improving community awareness and perception on skilled providers and their care by targeting women who prefer non-skilled providers and those who do not have any awareness is very important. Safe motherhood education using the available communication networks in the rural communities (health development army) and innovative informational campaigns are strategies to improve the intended awareness and perceptions of women. Furthermore, ensuring the seamless performance of basic essential obstetric care facilities (health centers) is also very critical, especially for improving the rate of skilled attendance at birth.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

All authors contributed equally during the process of proposal development. AG and AW participated in data collection and analysis. AG prepared the draft. Then AW and MF revised the drafts of the paper. All authors read and approved the final manuscript.

Acknowledgements

We are very grateful to Addis Ababa University for its technical and financial support. We would like to extend our heartfelt thanks to Professor Henry Mosley for his valuable comments starting from proposal development to the final manuscript preparation. We would also like to thank all of the study subjects who participated in this study for their commitment in responding to our interviews.

Author details

¹Department of Reproductive Health, Institute of Public Health, University of Gondar, Gondar, Ethiopia. ²Department of Preventive Medicine, School of Public Health, Addis Ababa University, Addis Ababa, Ethiopia. ³Department of Reproductive Health and Health Service Management, School of Public Health, Addis Ababa University, Addis Ababa, Ethiopia.

Received: 4 November 2012 Accepted: 9 April 2013

Published: 15 April 2013

References

- FDRE, MOH: **National reproductive health strategy: 2006–2015**. In Edited by Department of FH. Addis Ababa: Ministry of health; 2006.
- Högberg U: **The Decline in Maternal Mortality in Sweden**. *Am J Public Health* 2004, **94**(8):1312–1320.
- Ronsmans C, Graham WJ: **Maternal mortality: who, when, where, and why**. *Lancet* 2006, **368**(9542):1189–1200.
- WHO: **making pregnancy safer: the critical role of the skilled attendant. A joint statement by WHO, ICM, and FIGO**. Geneva: Department of Reproductive Health and Research, World Health Organization; 2004.
- Central Statistical Agency [Ethiopia], ICF international: *Ethiopia demographic and health survey 2011*. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central statistical agency and ICF international; 2012.
- [Ethiopia] CSA, Macro O: *Ethiopia Demographic and Health Survey 2005*. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central statistical agency; 2006.
- Carrough M, McCall M: **Skilled birth attendance: what does it mean and how can it be measured? A clinical skills assessment of maternal and child health workers in Nepal**. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics* 2005, **89**(2):200–208.
- Harvey SA, Ayabaca P, Bucagu M, Djihrina S, Edson WN, Gbangbade S, McCaw-Binns A, Burkhalter BR: **Skilled birth attendant competence: an initial assessment in four countries, and implications for the Safe Motherhood movement**. *Int J Gynecol Obstet* 2004, **87**(2):203–210.
- Paxton A, Bailey P, Lobis S, Fry D: **Global patterns in availability of emergency obstetric care**. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics* 2006, **93**(3):300–307.
- Harvey SA, Blandón YCW, McCaw-Binns A, Sandino I, Urbina L, Rodríguez C, Gómez I, Ayabaca P, Djihrinaf S, group tNmanhqi: **Are skilled birth attendants really skilled? A measurement method, some disturbing results and a potential way forward**. *Bull World Health Organ* 2007, **85**:783–790.
- Olsen BE, Hinderaker SG, Bergsjø P, Lie RT, Olsen OHE, Gasheka P, Kvåle G: **Causes and characteristics of maternal deaths in rural northern Tanzania**. *Acta Obstet Gynecol Scand* 2002, **81**(12):1101–1109.
- Sepehri A, Sarma S, Simpson W, Moshiri S: **How important are individual, household and commune characteristics in explaining utilization of maternal health services in Vietnam?** *Soc Sci Med* 2008, **67**:1009–1017.
- Babalola S, Fatusi A: **Determinants of use of maternal health services in Nigeria - looking beyond individual and household factors**. *BMC Pregnancy Childbirth* 2009, **9**(1):43.
- Tsui A, Ukwuani F, Guilkey D, Angeles G: **A Comparative multi-level analysis of health program effects on individual use of reproductive and sexual health services**. *MEASURE Evaluation Bulletin* 2003, **6**:1–12.
- Kruk ME, Galea S, Prescott M, Freedman LP: **Health care financing and utilization of maternal health services in developing countries**. *Health Policy Plan* 2007, **22**(5):303–310.
- Parkhurst JO, Penn-Kekana L, Blaauw D, Balabanova D, Danishevski K, Rahman SA, Onama V, Ssengooba F: **Health systems factors influencing maternal health services: a four-country comparison**. *Health Policy* 2005, **73**(2):127–138.

17. Turner AG, Angeles G, Tsui AO, Wilkinson M, Magnani R: **Sampling Manual for Facility Surveys for Population, Maternal Health, Child Health and STD Programs in Developing Countries.** In *Manual Series*. Chapel Hill: Carolina Population Center, University of North Carolina; 2001. No. 3.
18. COMMISSION FPC: Statistical Report of the, *Population and Housing Census Results*. Addis Ababa: UNFPA; 2007:2008.
19. Ethiopian Society of Population Studies: *Maternal Health Care Seeking Behaviour in Ethiopia: In-depth Analysis of the Ethiopian Demographic and Health Survey 2005*. Addis Ababa: Ethiopian Society of Population Studies; 2008.
20. Nigusie M, Mariam DH, Mitike G: **Assessment of safe delivery service utilization among women of childbearing age in North Gondar Zone, North West Ethiopia.** *Ethiop J Heal Dev* 2004, **18**(3):145–152.
21. WHO: *Antenatal care in developing countries: promises, achievements and missed opportunities: an analysis of trends, levels and differentials: 1990–2001*. World Health Organization; 2003.
22. Chandhiok N, Dhillon BS, Kambo I, Saxena NC: **Determinants of antenatal care utilization in rural areas of India: A cross-sectional study from 28 districts.** *The Journal of Obstetrics and Gynecology of India* 2006, **56**(1):47–52.
23. Karim A, Betemariam W, Yalew S, Alemu H, Carnell M, Mekonnen Y: **Programmatic correlates of maternal healthcare seeking behaviors in Ethiopia.** *Ethiop J Heal Dev* 2010, **24**(1):92–99.
24. Wirth M, Sacks E, Delamonica E, Storeygard A, Minujin A, Balk D: **"Delivering" on the MDGs? equity and maternal health in Ghana, Ethiopia and Kenya.** *East Afr J Public Health* 2008, **5**(3):133–141.
25. Chakraborty N, Islam MA, Chowdhury RI, Bari W, Akhter HH: **Determinants of the use of maternal health services in rural Bangladesh.** *Health Promot Int* 2003, **18**(4):327–337.
26. Stanton C, Blanc AK, Croft T, Choi Y: **Skilled care at birth in the developing world: progress to date and strategies for expanding coverage.** *J Biosoc Sci* 2007, **39**(1):109–120.
27. Prata N, Greig F, Walsh J, West A: **Ability to pay for maternal health services: what will it take to meet who standards?** *Health Policy* 2004, **70**(2):163–174.

doi:10.1186/1472-698X-13-20

Cite this article as: Worku et al.: Factors affecting utilization of skilled maternal care in Northwest Ethiopia: a multilevel analysis. *BMC International Health and Human Rights* 2013 **13**:20.

Submit your next manuscript to BioMed Central and take full advantage of:

- **Convenient online submission**
- **Thorough peer review**
- **No space constraints or color figure charges**
- **Immediate publication on acceptance**
- **Inclusion in PubMed, CAS, Scopus and Google Scholar**
- **Research which is freely available for redistribution**

Submit your manuscript at
www.biomedcentral.com/submit



Paper-V

The Contributions of Maternity Care to Reducing Adverse Pregnancy Outcomes: A Cohort Study in Dabat District, Northwest Ethiopia

Abebaw Gebeyehu Worku · Alemayehu Worku Yalew ·
Mesganaw Fantahun Afework

© Springer Science+Business Media New York 2013

Abstract This study was designed to evaluate the effect of maternity care by skilled providers on the occurrence of adverse pregnancy outcomes. A community-based cohort study was conducted at Dabat district, northwest Ethiopia, from December 1, 2011 to August 31, 2012. During the study period, 763 pregnant women were registered and followed until 42 days of their postpartum period. Use of skilled maternal care was the exposure variable. Reductions in occurrence of serious complications or death (adverse pregnancy outcomes) were used as outcome indicators. Data was collected at four time points; first contact, during the 9th month of pregnancy, within 1 week after delivery and at 42 days of postpartum. The effects of the exposure variable were evaluated by controlling potential confounders using logistic regression. One hundred and fifty-three (21 %) of the women encountered at least one obstetric complication or death during delivery and postpartum period. Hemorrhage and prolonged labor were the major types. Pregnancy outcomes for 41 women (5.6 %) were fetal, neonatal, or maternal deaths. Four or more ANC (antenatal care) visits, <4 ANC visits and

delivery by skilled attendant showed 25 % (OR 0.75; 95 % CI 0.25, 2.75), 9 % (OR 0.91; 95 % CI 0.43, 1.69) and 31 % (OR 0.69; 95 % CI 0.36, 1.33) reduction in the occurrence of adverse pregnancy outcomes, respectively. Skilled maternal care showed reduction in adverse pregnancy outcomes (complications and deaths). However, the associations were not significant. Improving the quality of maternity care services and ensuring continuum of care in the health care system are imperative for effective maternal health care in the study area.

Keywords Skilled maternal care · Adverse pregnancy outcomes

Background

Ethiopia is one of the countries with the highest maternal mortality ratio which is currently estimated at 676 maternal deaths per 100,000 live births [1]. For every maternal death, about 20 more women are estimated to suffer from acute or chronic pregnancy related illnesses [2]. Maternal morbidity includes all illnesses and complications associated with child bearing short of death, which can be an acute or a chronic condition. Some morbidity is instantaneously lethal, while the other is potentially lethal, disabling, or simply discomforting [3]. Acute maternal (obstetric) morbidity is a complication suffered during pregnancy through the postpartum period of 42 days that may directly cause maternal deaths. These obstetric or maternal complications include antepartum or postpartum hemorrhage, prolonged or obstructed labor, postpartum sepsis, complications of abortion, pre-eclampsia/eclampsia, ectopic pregnancy, and ruptured uterus. About 15 % of women are expected to experience maternal complications [4].

A. G. Worku (✉)
Department of Reproductive Health, Institute of Public Health,
University of Gondar, Gondar, Ethiopia
e-mail: abebawgebeyehu@yahoo.com

A. W. Yalew
Department of Preventive Medicine, School of Public Health,
Addis Ababa University, Addis Ababa, Ethiopia
e-mail: alemayehuwy@yahoo.com

M. F. Afework
Department of Reproductive Health and Health Service
Management, School of Public Health, Addis Ababa University,
Addis Ababa, Ethiopia
e-mail: mesganaw.f@gmail.com

“Ensuring skilled care for all women during pregnancy, childbirth, and the immediate postnatal period” is one of the strategies to reduce maternal and newborn mortality recommended by the World Health Organization [5]. Skilled care refers to the care provided to a woman and her newborn during pregnancy, childbirth and immediately after birth by an accredited and competent health care provider (skilled attendant) who has at her/his disposal the necessary equipment and the support of a functioning health system, including transport and referral facilities for emergency obstetric care. A skilled attendant is an accredited health professional such as a midwife, doctor or nurse, who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and the newborns [5].

Historical analysis from European countries, like Sweden and Asian countries, like Malaysia, Sri Lanka and Thailand indicate that introducing skilled attendants (midwives) in the health care system significantly reduces maternal mortality [6, 7]. In addition, national level analysis based on DHS data shows a negative correlation between the proportion of deliveries attended by a skilled attendant (midwife, nurse or doctor) and maternal mortality ratio [8]. Evidence also shows that intra-partum related deaths occur in settings with weak health systems and low coverage of skilled birth attendance [9]. However, making causal connections using aggregated data in both historical and ecological evidences is not possible. In historical analyses, the declines occurred when many other demographic, economic, political, cultural and scientific developments were established in the countries concerned. Some studies indicated that skilled delivery attendance was not associated with significant reductions in maternal mortality or stillbirth rates until coverage rates of about 40 % were achieved. Similarly, four or more antenatal visits were not associated with significant reductions in maternal deaths until about 60 % coverage was achieved [10]. According to this evidence, skilled maternal care would not have a significant impact in settings with low coverage. For instance, in Ethiopia, only 34, 10 and 6 % women have ANC, delivery, and postnatal care by skilled providers, respectively [1]. However, in Sub-Saharan Africa, the correlation between skilled care and maternal mortality is not clear. The DHS reports indicate that in many sub-Saharan African countries maternal mortality remains high (above 500/100,000 live births) though health professionals assisted more than half of the births. Furthermore, a quasi-experimental study in Burkina Faso revealed that a significant improvement in the use of skilled birth attendance at birth did not show a significant reduction in pregnancy-related mortality in the study periods [11].

The inconsistencies of studies lead to the question “Can the present maternity care do better in our setting?” The question is not only an academic interest but also a question of policy priority. Studies suggest that inconsistencies arise when countries do not fulfill the definition of skilled care. Countries with higher than the expected mortality may have health professionals without a functioning enabling environment and/or professionals may not be in fact skilled. Such poor competence and skills of health professionals are observed in some countries [12, 13].

This study was designed to evaluate the effect of skilled maternal care on unwanted pregnancy outcomes (complications and deaths).

Methods

Study Design

A community based prospective cohort study was carried out from December 1, 2011 to August 31, 2012.

Study Area

Dabat district is the study area. According to the 2007 census report, the district had an estimated total population of 145,458 living in thirty kebeles (lowest administrative units). Out of the total population, 15,818 (11 %) and 129,640 (89 %) were urban and rural inhabitants, respectively [14]. The district has 29 functioning health institutions (27 health posts and 2 health centers) at present. Currently, the University of Gondar uses it as a research center for its Health and Demographic Surveillance System (HDSS), which comprises seven rural and three urban kebeles. After the stratification of the district into climatic subzones, the research team randomly selected seven kebeles from highland (cold), one kebele from mid land (temperate) and two kebeles from low land (hot) [15]. Seventeen experienced data collectors and three onsite supervisors were employed for the ten sites (kebeles). We purposely selected this district due to its potential benefits for our study. Since the study required repeated home visits and follow up, these trained data collectors and supervisors working at the site were considered.

Study Population and Sampling

All pregnant women who were permanent residents of the DHSS sites were included in our study. Sample size was calculated by assuming a 95 % confidence level, 80 % power and a 1:2 ratio of skilled maternal care users (exposed), and non-users (non-exposed). In addition, we considered a relative risk of two, 15 % have had the

probability of at least one complication and a possible follow-up loss of 10 %. All pregnant women in the selected kebeles were identified by a baseline survey and joined the follow up scheme. Then new pregnant women were added through a monthly detection until the sample size was adequate for the analysis.

Definition of Exposure and Outcome Variables

In this study, women who used skilled maternal care (care from a doctor, health officer, nurse, or midwife) were considered as the exposed group, and women who did not use skilled maternal care were considered as the non-exposed group. Medical doctors (graduates after receiving 6 years of college education) are expected to manage referral cases at the hospital level. Health officers are trained for 4 years for their bachelor's degree and work as clinicians in the rural set ups (health centers). The qualification of nurses or midwives can be bachelor's degree (4 years training) or diploma (2 years training) and they work in health centers or hospitals. The presence of skilled maternity care was defined based on existing health care system in which most of the maternity care was provided by nurses or midwives at health centers. Facilities are organized to provide basic emergency/essential obstetric care at health centers and comprehensive emergency/essential obstetric care at hospitals.

The occurrence of serious complications or death was an outcome indicator to evaluate the effects of maternal care by a skilled provider. Cohorts of pregnant women were followed to see variations in the outcome of interest. According to the Tenth International Classification of Diseases, maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes [16]. Perinatal mortality refers to the death of fetus after the time of viability (stillbirth) and the death of the neonate in the first week of life. For international comparisons, World Health Organization (WHO) recommends reporting of stillbirths with a birth weight of 1,000 g or more, 28 weeks' gestation or more, or a body length of 35 cm or more [17].

In this study, hemorrhage refers to any of the following: postpartum bleeding that requires treatment (e.g. provision of intravenous fluids, uterotonic drugs or blood), retained placenta, severe bleeding from lacerations (vaginal or cervical), vaginal bleeding in excess of 500 ml after childbirth, and more than one pad soaked in blood in 5 min. Prolonged or obstructed labor (dystocia, abnormal labor) refers to any of the following; >12 h labor after first stage of labor, >1 h after second stage of labor, cephalopelvic disproportion and malpresentation (transverse, brow

or face presentation). Eclampsia is represented by the occurrence of convulsions. Postpartum sepsis (infection) refers to fever for more than 24 h after delivery and any one of the following signs and symptoms: lower abdominal pain, purulent, offensive vaginal discharge (lochia) and tender uterus. Definitions of complications were adopted from WHO guideline for monitoring emergency obstetric care [4].

Data Collection

At the beginning, all pregnant women in the DHSS (kebeles) were identified through a baseline survey. Then, informants and data collectors detected and included additional cohorts monthly. Seventeen data collectors and three supervisors were deployed for data collection. In addition, at least one informant in each village (a farmer living onsite) was involved. On the whole, 34 informants were involved for the detection of pregnant women. Data was collected using a follow up questionnaire, which was prepared for a progressive evaluation. The questionnaire included four major components; background information at the first contact, and the three evaluation tools corresponding to the three time points; during pregnancy (9th month), within 1 week after delivery, and at 42 days of postpartum. Special cases like women with abortion had only first evaluation and women with stillbirth (pregnancy loss after 28 weeks of gestation) and pregnant women with preterm birth may not have first evaluation. In this case, the first evaluation was conducted together with the second and third evaluation by excluding some questions not applicable for the time. Interview with mothers using questionnaire and checklists were the means of data collection at home. During the interviews, the types of providers, types of services they received, the number of antenatal visits and any complications, and morbidities were recorded. Data collectors were trained and used guidelines in the data collection manual to level the types of morbidities as complications. Women having illness, identified at home visits were urged to get examination and treatment at the nearby health institution. Data quality was maintained by intensive training of field workers and supervisors, pre-testing of data collection tools, and close supervision by resident supervisors and principal investigators.

Data Processing and Analysis

Two experienced clerks performed the data entry using the EPI Info version 3.5.3 software. After checking the consistency and completeness, data were exported to SPSS version 20 software for analysis. Tables and texts were used to describe the provision of essential services, the occurrence of complications and deaths. Cumulative

Table 1 Frequency and percentage distribution of study subjects according to selected socio-demographic characteristics, Dabat, 2012

Characteristics	n	%
<i>Religion</i>		
Orthodox Christian	745	97.6
Muslim	18	2.4
<i>Ethnicity</i>		
Amhara	760	99.6
Tigre	3	0.4
<i>Marital status of mother</i>		
Unmarried (single)	28	3.7
Married	699	91.6
Widowed	20	2.6
Divorced	7	0.9
Separated	9	1.2
<i>Number of births</i>		
1	263	34.5
2–3	223	29.2
4–5	168	22.0
6+	109	14.3
<i>Age</i>		
<20	89	11.7
20–34	548	71.8
35+	126	16.5
<i>Educational status of mother</i>		
Illiterate	515	67.5
Primary	104	13.6
Secondary and above	144	18.9
<i>Educational status of husband/partner</i>		
Illiterate	373	48.9
Primary	238	31.2
Secondary and above	152	19.9
<i>Residence</i>		
Rural	571	74.8
Urban	192	25.2
<i>Occupation of husband</i>		
Farmer	586	76.8
Merchant	40	5.2
Government employee	78	10.2
Others	59	7.7
Total	763	100

incidences were compared among skilled maternal care users and non-users. Both bivariate and multivariate analyses were used to examine the association between the exposure and outcome variables. Multivariable models using logistic regression were used to control confounding variables. The odds ratios with a 95 % confidence interval estimates were used to evaluate the strength and significance of association.

Ethical Consideration

The Institutional Review Board of the College of Health Sciences, Addis Ababa University, reviewed and approved the study protocol. During data collection, consent was sought and all participants signed written agreements (consent forms). Participants were informed about their right to withdraw at any time during the study. To ensure confidentiality, codes instead of names were used during data entry and in depicting the results of the study. Furthermore, the collected information was carefully locked. Participants found sick were referred to the nearby health centre for medical care.

Results

During the follow up period, 763 pregnant women were registered and were completed their first evaluation. Out of the total registered, 742 (97.2 %) were followed until the second evaluation and 727 (95.3 %) completed their follow up, that means followed until the third evaluation. Incomplete follow up for the remaining 36 (4.7 %) of the registered women was due to their visiting time, which was out of the study period.

Socio-Demographic Characteristics of the Study Population

The index pregnancy for 263 (34.5 %) of the mothers was their first pregnancy. About 71.8 % were between 20 and 34 years, 11.7 % were teenagers (<20 years) and 16.5 % were elderly gravid (35 years and above). The mean age was 27.4 ± 6.8 years, with a range of 15–49 years. The majority of the interviewed mothers (67.5 %) and their husbands (48.9 %) had no formal education (Table 1).

Components of Services Delivered by Skilled Providers During ANC and Delivery Care

Of the total pregnant women, 265 (34.7 %) received antenatal care from skilled providers, that is, from a doctor, health officer, nurse, or midwife. Among these women, only 75 (9.8 %) had four or more visits. Among the various screening services, 94 % of the ANC users had their blood pressure measured; 87.5 % had their weight measured; 90 % were screened for HIV; 4.5 % were screened for syphilis, and 33 % had urine samples taken. Tetanus immunization was provided to 42 % of pregnant women. About 71 % took iron tablets during their pregnancy. About 64.5 % of the pregnant women were informed on fetal growth. Counseling and advice were provided about nutrition, birth preparedness and

Table 2 The effect of skilled ANC for utilization of skilled birth attendant without and with adjustment of possible confounders, Dabat, 2012

Variables	Gave birth at HI by skilled provider			
	n	N (%)	Crude OR (95 % CI)	Adjusted OR (95 % CI)
<i>ANC by a skilled provider</i>				
No	481	27 (5.6)	1	1
Yes	261	107 (41.0)	11.68 (7.38, 18.51)	3.38 (1.93, 5.91)
<i>Birth order</i>				
1	256	79 (30.9)	1	1
2–3	216	28 (13.0)	0.33 (0.21, 0.54)	1.39 (0.70, 2.75)
4–5	163	17 (10.4)	0.26 (0.15, 0.46)	0.61 (0.25, 1.49)
6+	107	10 (9.3)	0.23 (0.11, 0.45)	0.81 (0.28, 2.37)
<i>Pregnancy wanted</i>				
No	179	29 (16.2)	1	1
Yes	563	105 (18.7)	1.19 (0.76, 1.86)	1.56 (0.85, 2.83)
<i>Age</i>				
<20	86	17 (19.8)	1	1
20–34	532	99 (18.6)	0.93 (0.52, 1.65)	0.85 (0.38, 1.91)
35+	124	18 (14.5)	0.69 (0.33, 1.43)	0.92 (0.23, 2.88)
<i>Residence</i>				
Rural	555	33 (5.9)	1	1
Urban	187	101 (54.0)	18.58 (11.79, 29.26)	5.95 (3.32, 10.67)
<i>Educational status of mother</i>				
Illiterate	503	32 (6.4)	1	1
Primary	100	22 (22.0)	4.15 (2.29, 7.51)	2.53 (1.22, 5.25)
Secondary and above	139	80 (57.6)	19.96 (12.21, 32.62)	4.56 (2.04, 10.19)
<i>Educational status of husband</i>				
Illiterate	364	24 (6.6)	1	1
Primary	228	29 (12.7)	2.06 (1.17, 3.65)	1.36 (0.71, 2.59)
Secondary and above	150	81 (54.0)	16.63 (9.85, 28.08)	1.27 (0.57, 2.84)
<i>History of contraceptive use</i>				
No	453	49 (10.8)	1	1
Yes	289	85 (29.4)	3.44 (2.33, 5.07)	1.31 (0.77, 2.21)

complication readiness to 62, 47 and 24 % of the women, respectively.

Skilled attendants assisted 134 (18 %) of women during delivery. Detailed information was not provided for

the two women. Out of the 132 women who had delivery by skilled attendants, 71 % had their blood pressure measured; 73 % were informed on labor progress; 75 % were informed on fetal condition, and 88 % took drugs to prevent bleeding. Their baby weight was measured and vaccine was provided among 71 and 70.5 % of the mothers, respectively. Counseling and advice was provided on early and exclusive breast feeding, baby care, nutrition, family planning, postnatal care and complication readiness to 78, 52, 40, 30, 52 and 34 % of the women, respectively. Most (85 %) of the births assisted by skilled providers took place at health centers and only 20 (15 %) at a hospital. ANC by a skilled provider was significantly associated with subsequent delivery care by a skilled attendant (Table 2).

Adverse Pregnancy Outcomes (Incidences of Complications and Deaths)

One hundred fifty-three (21 %) of the women encountered at least one obstetric complication or death during delivery and post partum period. The common types of complications during delivery and postpartum period were hemorrhage and prolonged labor. During the follow up period, pregnancy outcomes for 20 (2.8 %) women were stillbirths. Another 20 (2.8 %) of the women lost their baby in the first month of the postnatal period where most (80 %) of the deaths occurred in the first week of life (Table 3).

The Effect of Maternity Care by Skilled Providers in Reducing Obstetric Complications

The presence of a skilled attendant at birth is more important to control bleeding. Using skilled attendants at birth reduced the occurrence of hemorrhage by about 50 %. However, higher incidences of prolonged labor, sepsis/infection, perinatal and neonatal deaths were observed among women who used skilled attendants at the time of birth (Table 4). After controlling potential confounders, four or more ANC visits, <4 ANC visits and delivery by skilled attendant showed 25 % (OR 0.75; 95 % CI 0.25, 2.75), 9 % (OR 0.91; 95 % CI 0.43, 1.69) and 31 % (OR 0.69; 95 % CI 0.36, 1.33) reduction in the occurrence of adverse pregnancy outcomes, respectively. However, the findings were not significant (Table 4).

From the potential confounders, living in rural area was found to be a significant risk factor for the occurrence of at least one type of complication or death. The adjusted odds ratio indicated that urban residence reduces occurrence of at least one type of complication or death by 68 % compared to rural residence (OR 0.32, 95 % CI 0.16, 0.66) (Table 4).

Table 3 Incidence of major intra-partum and postpartum obstetric complications and death among cohorts of pregnant women during the follow up period, Dabat, 2012

Complications/death	Total events (incidence/100)	Incidences according to skilled maternal care					
		ANC by a skilled provider			Delivery by a skilled provider		
		No (%)	Yes (%)	<i>P</i> value	No (%)	Yes (%)	<i>P</i> value
Hemorrhage	65 (8.9)	48 (10.1)	17 (6.7)	0.13	59 (9.9)	6 (4.7)	0.06
Prolonged labor	41 (5.6)	30 (6.3)	11 (4.3)	0.27	31 (5.2)	10 (7.8)	0.25
Convulsion	19 (2.6)	9 (1.9)	10 (4.0)	0.14	16 (2.7)	3 (2.3)	0.82
High fever/sepsis	17 (2.3)	12 (2.5)	5 (2.0)	0.64	12 (2.0)	5 (3.9)	0.20
Fetal death (stillbirth)	20 (2.8)	15 (3.2)	5 (2.0)	0.35	14 (2.3)	6 (4.6)	0.15
First week neonatal death	16 (2.2)	8 (1.7)	8 (3.2)	0.20	12 (2.0)	4 (3.1)	0.44
Perinatal death	36 (5.0)	23 (4.8)	13 (5.3)	0.86	26 (4.3)	10 (7.8)	0.11
All neonatal death	20 (2.8)	10 (2.1)	10 (4.0)	0.15	16 (2.7)	4 (3.1)	0.79
Maternal death	1 (0.14)	1	0		1	0	
At least one type of complication ^a	153 (21.0)	107 (22.6)	46 (18.2)	0.17	133 (22.2)	20 (15.5)	0.09
Total	727 (100)	474 (100)	253 (100)		598 (100)	129 (100)	

^a Some women have more than one complication

Discussion

The exposure variable, use of maternity care by a skilled provider was assessed through the content of services received and the kinds of information given to women during their care. The effect of maternal care by a skilled provider was evaluated based on the occurrence of at least one complication or death during delivery or postpartum period.

The coverage of ANC and delivery services found in our study was in line with the recent nationwide demographic and health survey [1]. According to the report, the national coverage for receiving ANC and delivery care by skilled providers were 33.9, and 10 % respectively [1]. However, a study by Regassa in Southern Ethiopia reported a much higher coverage (77.4 %) of ANC by skilled providers [18]. The high coverage in the Regassa study could be due to differences in the considerations of skilled providers. Though not clearly stated, the study involved trained health professionals, including health extension workers. However, health extension workers are not considered as skilled providers according to the standard definition. Besides, including them as skilled providers may inflate the finding. ANC by skilled providers indicated a significant impact on mothers' subsequent health seeking behavior (use of delivery service). The positive effect of the ANC service for subsequent delivery care was also observed in different studies done elsewhere [19, 20]. However, ANC by skilled providers did not show a significant contribution to the reduction of unwanted pregnancy outcomes when adjusted for potential confounding variables. Evidences showed that focused ANC could reduce many complications and the

possibility of deaths. Some studies revealed its significant impact on stillbirth or perinatal mortality rates [21]. This contradicting finding could be due to the quality of care (the extent of the exposure factor). In this study, the contents of ANC services showed that the majority of the women did not have urine examination, and syphilis screening was very rare. The absence of such important screening services will undermine the efforts to prevent preterm labor or stillbirth due to urinary tract infections like pyelonephritis or syphilis. About three-fifths of the pregnant women were not immunized for tetanus. Consequently, the value of ANC in reducing neonatal death due to tetanus infection will be under a question mark. In addition, during their ANC visits, a significant proportion of the women did not discuss birth preparedness and complication readiness that can affect outcomes in many ways.

In this study, skilled attendant during delivery was found more beneficial in reducing hemorrhage by 50 % than other complications or deaths. In sub-Saharan Africa, about 34 % of the maternal deaths are attributable to hemorrhage [22]. According to recent studies, hemorrhage is also the main cause of maternal death in developed countries [23]. The implication of this finding is that the presence of a skilled attendant during delivery can avert many maternal deaths by reducing the occurrence of hemorrhage. However, delivery by skilled providers did not contribute significantly to reducing the occurrence of complications or deaths. One of the reasons for the non-significant association could be the content of service provided. In this study, about one-fourth of the women were not informed on labor progress and fetal conditions indicating the inadequate

Table 4 The effect of skilled maternal care in reducing occurrence of complications and death during delivery and postpartum period without and with adjustment of possible confounders

Variables	At least one complication at birth or postpartum			
	n = 727	n (%)	Crude OR (95 % CI)	Adjusted OR (95 % CI)
<i>Delivery by skilled provider</i>				
No	598	133 (22.2)	1	1
Yes	129	20 (15.5)	0.64 (0.38, 1.07)	0.69 (0.36, 1.33)
<i>ANC by skilled provider</i>				
No or non-skilled	474	107 (22.6)	1	1
1–3 visits by skilled	184	39 (21.2)	0.92 (0.61, 1.40)	0.91 (0.43, 1.69)
4 + visits by skilled	69	7 (10.1)	0.39 (0.17, 0.87)	0.75 (0.25, 2.75)
<i>Birth order</i>				
1	249	38 (15.3)	1	1
2–3	214	48 (22.4)	1.61 (1.00, 2.57)	1.54 (0.88, 2.71)
4–5	161	44 (27.3)	2.09 (1.28, 3.41)	1.70 (0.90, 3.20)
6+	103	23 (22.3)	1.60 (0.90, 2.85)	1.21 (0.57, 2.59)
<i>Age</i>				
<20	85	17 (20.0)	1	1
20–34	522	105 (20.1)	1.01 (0.57, 1.79)	0.77 (0.38, 1.53)
35+	120	31 (25.8)	1.39 (0.71, 2.72)	0.98 (0.41, 2.37)
<i>Educational status of mother</i>				
Illiterate	497	120 (24.1)	1	1
Primary	99	20 (20.2)	0.80 (0.47, 1.35)	0.94 (0.52, 1.67)
Secondary and above	131	13 (9.9)	0.35 (0.19, 0.64)	0.46 (0.18, 1.14)
<i>Educational status of husband/partner</i>				
Illiterate	358	87 (24.3)	1	1
Primary	226	46 (20.4)	0.80 (0.53, 1.19)	1.15 (0.75, 1.75)
Secondary and above	143	20 (14.0)	0.51 (0.30, 0.86)	0.59 (0.26, 1.33)
<i>Residence</i>				
Rural	549	135 (24.6)	1	1
Urban	178	18 (10.1)	0.35 (0.20, 0.58)	0.32 (0.16, 0.66)
<i>Pregnancy wanted</i>				
No	175	40 (22.9)	1	1
Yes	552	113 (20.5)	0.87 (0.58, 1.31)	0.80 (0.51, 1.26)
<i>Contraceptive used before pregnancy</i>				
No	449	106 (23.6)	1	1

Table 4 continued

Variables	At least one complication at birth or postpartum			
	n = 727	n (%)	Crude OR (95 % CI)	Adjusted OR (95 % CI)
Yes	278	47 (16.9)	0.66 (0.45, 0.97)	0.72 (0.46, 1.10)
<i>History of abortion or still birth</i>				
No	586	117 (20.0)	1	1
Yes	141	36 (25.5)	1.37 (0.90, 2.11)	1.24 (0.79, 1.96)

monitoring of labor. Counseling and advice on different types of maternal and childcare were also unsatisfactory. In this regard, the skills of providers may be the main cause for unsatisfactory services. In many developing countries, competency and skill retention of providers are major concerns for skilled birth attendance [12, 24]. The other possible reason is that in Ethiopia, many women seek service after trying the traditional options at home [25]. The delay at home reduces the chance of survival or aggravates complications. In this line, the concept of continuum of care is very important for maternal and neonatal survival. The continuum starts with the woman and her family in the woman's own home (self-care and prevention). Then skilled care can be provided through domiciliary care or at primary health care facilities. For low risk women at these levels, health and other benefits can result from having their maternity care led by midwives rather than physicians [26]. When complications occur, women and/or their newborns need care at secondary or tertiary levels of the health system, depending on the seriousness of their respective conditions. Studies indicate that access to emergency obstetric care is more important for maternal and neonatal survival in developing countries with very low skilled maternity care. Findings in such studies showed that both maternal mortality and stillbirth rates decreased sharply as the cesarean section rates increased [27, 28]. The effect of caesarean section in reducing intra-partum related neonatal deaths was also observed in other studies [9]. However, the successful provision of the continuum of care depends on the presence of a functioning health care system with the necessary infrastructure, transport availability for referral and collaboration among providers at different levels that could be the major challenge in the health care system of Ethiopia.

One of the limitations of this study is that judging the severity of an obstetric problem and to consider it as a complication, based on a woman's self-report, can be challenging compared to medical examinations at health care facilities. Women can under report in some types of

complications and over report in others. To reduce its effect, data collectors took an extensive training about when they should consider the morbidity as a complication. The data collectors had also repeated exposures in collecting maternal health related data. The other possible limitation is that the study considers the occurrence of at least one type of complication or death to answer the objectives. In reality, the effect of skilled care may vary according to the specific type of complication or mortality. However, the samples by type of complication and mortality were very small to do such analyses. Hence, the study lacks statistical power to draw conclusions based on specific type of complications and deaths.

In conclusion, this study demonstrated that maternity care by killed providers showed reduction in adverse pregnancy outcomes (complications and deaths). However, the associations were not significant. Improving the quality of maternity care services and ensuring continuum of care in the health care system are imperative for an effective maternal health care in the study area. Improving the skills of providers, the availability of basic equipment needed for maternal care, the referral system, and monitoring the health facility using the signal functions on regular bases are the major activities need for effective maternal services. Further research is mandatory, especially to evaluate the long-term outcomes (after 42 days) and specific types of complications using an adequate sample.

Acknowledgments We are very grateful to Addis Ababa University for its technical and financial support. We would like to extend our heartfelt thanks to Professor Henry Mosley for his valuable comments starting from proposal development to the final manuscript preparation. We would also like to thank all of the study subjects who participated in this study.

References

1. CSA/Ethiopia, ICF International. (2012). *Ethiopia demographic and health survey 2011*. Ethiopia: Addis Ababa.
2. Filippi, V., Ronsmans, C., Campbell, O. M. R., et al. (2006). Maternal health in poor countries: The broader context and a call for action. *Lancet*, 368(9546), 1535–1541.
3. Campbell, O. M. R. (1991). *Measuring the determinants of maternal morbidity and mortality: Defining and selecting outcomes and determinants, and demonstrating associations*. London: London School of Hygiene and Tropical Medicine.
4. World Health Organization (WHO). (2009). *Monitoring emergency obstetric care: A handbook*. Geneva: WHO.
5. World Health Organization (WHO). *Making pregnancy safer: The critical role of the skilled attendant*. WHO. http://www.who.int/maternal_child_adolescent/documents/9241591692/en/index.html.
6. Högberg, U. (2004). The decline in maternal mortality in Sweden. *American Journal of Public Health*, 94(8), 1312–1320.
7. Lerberghe, W. V., & Brouwere, V. D. (2001). Of blind alleys and things that have worked: History's lessons on reducing maternal mortality. In V. D. Brouwere & W. V. Lerberghe (Eds.), *Safe motherhood strategies: A review of the evidence* (pp. 1–33). UK: ITG Press.
8. Graham, W. J., Bell, J. S., & Bullough, C. H. (2001). Can skilled attendance at delivery reduce maternal mortality in developing countries? In V. D. Brouwere & W. V. Lerberghe (Eds.), *Safe motherhood strategies: A review of the evidence* (pp. 97–129). UK: ITG Press.
9. Lawn, J. E., Kinney, M., Lee, A. C. C., et al. (2009). Reducing intrapartum-related deaths and disability: Can the health system deliver? *International Journal of Gynaecology and Obstetrics: The Official Organ of the International Federation of Gynaecology and Obstetrics*, 107(Suppl 1), S123–S142. doi:10.1016/j.ijgo.2009.07.021.
10. McClure, E. M., Goldenberg, R. L., & Bann, C. M. (2007). Maternal mortality, stillbirth and measures of obstetric care in developing and developed countries. *International Journal of Gynaecology and Obstetrics: The Official Organ of the International Federation of Gynaecology and Obstetrics*, 96(2), 139–146. doi:10.1016/j.ijgo.2006.10.010.
11. Hounton, S., Menten, J., Ouédraogo, M., et al. (2008). Effects of A skilled care initiative on pregnancy related mortality in rural Burkina Faso. *Tropical Medicine & International Health*, 13, 53–60.
12. Harvey, S. A., Blandón, Y. C. W., McCaw-Binns, A., et al. (2007). Are skilled birth attendants really skilled? A measurement method, some disturbing results and a potential way forward. *Bulletin of the World Health Organization*, 85, 783–790.
13. Harvey, S. A., Ayabaca, P., Bucagu, M., et al. (2004). Skilled birth attendant competence: An initial assessment in four countries, and implications for the safe motherhood movement. *International Journal of Gynecology & Obstetrics*, 87(2), 203–210. doi:10.1016/j.ijgo.2004.06.017.
14. FDRE PCCo. (2008). *Statistical report of the 2007 population and housing census of Ethiopia results*. Addis Ababa: UNFPA, Population Census Commission.
15. Tadesse, T., Getachew, A., & Admassu, M., et al. (2011). Demographic and health survey at Dabat district in Northwest Ethiopia: Report of the 2008 baseline survey. *Ethiopian Journal of Health and Biomedical Science*, 4(Special issue), 1–16.
16. World Health Organization (WHO). (2007). *Maternal mortality in 2005: Estimates developed by WHO, UNICEF, UNFPA, and the World Bank*. Geneva: WHO.
17. Frøen, J. F., Cacciatore, J., McClure, E. M., et al. (2011). Stillbirths: Why they matter. *Lancet*, 377(9774), 1353–1366.
18. Regassa, N. (2011). Antenatal and postnatal care service utilization in southern Ethiopia: A population-based study. *African Health Sciences*, 11(3), 390–397.
19. Sepehri, A., Sarma, S., Simpson, W., et al. (2008). How important are individual, household and commune characteristics in explaining utilization of maternal health services in Vietnam? *Social Science and Medicine*, 67(6), 1009–1017. doi:10.1016/j.socscimed.2008.06.005.
20. Amano, A., Gebeyehu, A., & Birhanu, Z. (2012). Institutional delivery service utilization in Munisa Woreda, South East Ethiopia: A community based cross-sectional study. *BMC Pregnancy and Childbirth*, 12(1). doi:10.1186/1471-2393-12-105.
21. Menezes, E. V., Yakoob, M. Y., Soomro, T., et al. (2009). Reducing stillbirths: Prevention and management of medical disorders and infections during pregnancy. *BMC Pregnancy and Childbirth*, 9, 1. doi:10.1186/1471-2393-9-s1-s4.
22. Khan, K. S., Wojdyla, D., Say, L., et al. (2006). World Health Organization (WHO) analysis of causes of maternal death: A systematic review. *Lancet*, 367(9516), 1066–1074.
23. Cristina Rossi, A., & Mullin, P. (2012). The etiology of maternal mortality in developed countries: A systematic review of literature. *Archives of Gynecology and Obstetrics*, 285(6), 1499–1503.

24. Darmstadt, G. L., Lee, A. C. C., Cousens, S., et al. (2009). 60 million non-facility births: Who can deliver in community settings to reduce intrapartum-related deaths? *International Journal of Gynaecology and Obstetrics: The Official Organ of the International Federation of Gynaecology and Obstetrics*, 107(Suppl 1), S89–S112. doi:[10.1016/j.ijgo.2009.07.010](https://doi.org/10.1016/j.ijgo.2009.07.010).
25. Warren, C. (2010). Care seeking for maternal health: Challenges remain for poor women. *Ethiopian Journal of health development*, 24(1). doi:[10.4314/ejhd.v24i1.62950](https://doi.org/10.4314/ejhd.v24i1.62950).
26. Sutcliffe, K., Caird, J., Kavanagh, J., et al. (2012). Comparing midwife-led and doctor-led maternity care: A systematic review of reviews. *Journal of Advanced Nursing*, 68(11), 2376–2386. doi:[10.1111/j.1365-2648.2012.05998.x](https://doi.org/10.1111/j.1365-2648.2012.05998.x).
27. Bhutta, Z. A., Darmstadt, G. L., Haws, R. A., et al. (2009). Delivering interventions to reduce the global burden of stillbirths: Improving service supply and community demand. *BMC Pregnancy and Childbirth*, 9(Suppl 1), S7.
28. Haws, R. A., Yakoob, M. Y., Soomro, T., et al. (2009). Reducing stillbirths: Screening and monitoring during pregnancy and labour. *BMC Pregnancy and Childbirth*, 9, 1. doi:[10.1186/1471-2393-9-s1-s5](https://doi.org/10.1186/1471-2393-9-s1-s5).

ANNEX 2: DATA COLLECTION TOOLS

TOOLS FOR POPULATION BASED SURVEY

Women Questionnaire

NB: When you get the household, ask presence of women who gave birth in the past one year. If YES, get consent and continue, If NO, thanks and go to the next household.

Information sheet

Read the statements to the respondent (mother or her family members)

Purpose of the research project: This study is one part of evaluating skilled maternal care utilization in North Gondar zone. The main aim of this particular part is to assess level of knowledge, perceptions and experience of women related to skilled maternal care during pregnancy, delivery, and the postpartum period.

Procedure: In order to collect our data, we invite you to take part in our project. If you are willing, you need to understand and sign the consent form. We will ask some questions about resources and the people in this household, and then we will talk about health and about issues related to pregnancy and childbirth.

Risk and /or discomfort: By participating in this research project you may feel some discomfort especially on sacrificing your time otherwise no risk in participating in this study.

Benefits: If you are participating in this research project, the output of the study will have both direct and indirect benefit to you, as you and your families will use the services in the future.

Incentives/payments for participating: You will not be provided any incentives or payment to take part in this project.

Confidentiality: The information collected from this research project will kept confidential and information about you that will be collected by this study will be stored in a file, without your name, but a code number assigned to it. And it will not be revealed to anyone except the principal investigator and will be kept locked with key.

Right to refusal or withdraw: You have the full right to refuse from participating in this research. Your refusal will not affect you from getting any kind of health related service.

Person to contact: If you want to know more information you can contact;

Ato Abebaw Gebeyehu by Tel: mobile 251-920314519 or

IRB of AAU by Tel: 251-115538734, e-mail: aaumfirb@yahoo.com

Consent Form

With due understanding of the aforementioned information, are you willing to participate in the study?

Yes ☐

Signature/finger print of the participant

Signature/finger print _____ date _____

(Proceed with the interview)

No ☐ Terminate the interview)

Signature of the interviewer

Name _____ Signature _____ date _____

Supervisors/Researcher remark and signature

Name _____ Signature _____ date _____

	District	Kebele	HH head	Women	Data collector
Name					
ID (code)					
Date of data collection:			Time of data collection:		

SECTION 1. HOUSEHOLD AND RESPONDENT'S BACKGROUND
HOUSEHOLD INFORMATION

Q.	Question and filters	RESPONSE CODE		SKIP
101	How many family members are there in this house hold?	Family members in number		
102	What is the main source of drinking water for members of your household?	1. Piped water 2. Open well 3. Covered well/borehole 4. Spring 5. River/stream Other _____		
103	Where is that water source located?	1. In own dwelling 2. In own compound 3. Elsewhere		
104	How long does it take to go there, get water, and come back?	Minutes..... 99. Don't know		
105	What kind of toilet facility do members of your household usually use?	0. No facility/bush/field 1. Flush toilet 2. Traditional pit toilet 3. Ventilated improved pit (VIP) Latrine Other (specify) _____		
106	Do you share these facilities with other households?	0. No 1. Yes		
107	Does your household have the following?	No (0)	Yes (1)	
	Electricity			
	Radio			
	Television			
	Telephone - landline			
	Telephone - mobile			
	Refrigerator			
108	What type of fuel does your household mainly use for cooking?	1. Electricity 2. Kerosene 3. Charcoal 4. Firewood, straw 5. Dung Other _____		
109	Main material of the floor Record observation	1. Natural floor; earth/sand 2. Dung 3. Finished floor ; cement/bricks Other _____		

110	Main material of the roof Record observation	1. Thatch/leaf 2. Corrugated iron 3. Finished roofing Other (specify)_____	
111	Does any member of this household own land that can be used for agriculture?	0. No 1. Yes	1 15
112	How many square meter of agricultural land do members of this household own?	square meter	
113	How many of the following animals does this household own?	Type of animals	Quantity
		Cows/oxen/bulls	
		Horses/donkeys/mules	
		Goats and Sheep	
		Chickens	
114	Does any member of this household have an account with a bank/credit association/micro finance?	0. No 1. Yes	

RESPONDENT'S BACKGROUND

115	How long have you been living continuously in this Kebele?	Years Always	
116	In what month and year were you born?	Month..... Year 99. Don't know	
117	What is your educational level?	1. Illiterate 2. Elementary(1-6) /read and write 3. Secondary(8-10/12) 4. Tech./voc. Certificate 5. Diploma 6. Degree or higher	
118	What is the educational level your partner/husband?	1. Illiterate 2. Elementary(1-6) /read and write 3. Secondary(8-10/12) 4. Tech./voc. Certificate 5. Diploma 6. Degree or higher	
119	How often do you usually listen to the radio?	1. Not at all 2. Less than once a week 3. At least once a week 4. Almost every day	
120	How often do you usually watch television?	1. Not at all 2. Less than once a week 3. At least once a week 4. Almost every day	
121	What is your religion?	1. Orthodox 2. Catholic 3. Protestant 4. Muslim Other_____	
122	What is your ethnicity? SELECT THE MAJOR ETHNIC GROUP.	1. Amhara 2. Tigre 3. Agew Others (specify)_____	

123	What is your occupation, that is, what kind of work do you mainly do?	1. Farmer 2. Merchant 3. Government employee Others (specify)_____	
124	What is your partner/husband occupation?	1. Farmer 2. Merchant 3. Government employee Others (specify)_____	
125	What is your marital status currently?	1. Single 2. Married 3. Widowed 4. Divorced 5. Separated Others (specify)-----	

SECTION 2: AWARENESS AND PERCEPTIONS OF SAFE MOTHERHOOD

Q.	Question and filters	RESPONSE CODE		SKIP
201	Have you ever heard of the term “skilled care”?	0. No 1. Yes 99. Don’t know		
202	Have you ever heard the term”birth preparedness”?	0. No 1. Yes 99. Don’t know		204
203	Which one of the following is the main source you use to see, hear, or read about “birth preparedness”?	1. Mass media (radio or television) 2. Written materials 3. Community events (meetings) 4. Friends/neighbor 5. Family members 6. TBA/HEW 7. Religious leader 8. Health professionals Others (specify).....		
204	Do you think that some women are more likely to have serious health problems related to pregnancy or childbirth than others?	0. No 1. Yes 99. Don’t know		
205	Are women with the following character most likely to have serious health problems related to pregnancy or childbirth compared with others? Please write the responses after confirmation	No (0)	Yes (1)	
	Older women Younger women Women having 1st birth Women w/ more than 5 children Women delivered babies closely Short women Poor women			
206	Who is safer assistant for women during delivery?	1. Health professionals (doctor, nurse or midwife) 2. TBA 3. Relative 99. Don’t know		

207	After a normal delivery, a woman needs a check-up. Do you agree by this idea?	0. Disagree 1. Agree 99. Don't know	
208	It is okay for a woman to leave the house/compound in the first seven days after she gives birth. Do you agree by this idea?	0. Disagree 1. Agree 99. Don't know	
209	It is okay for a woman to leave the house/compound in the first six weeks after she gives birth. Do you agree by this idea? Ask the mother for how many days she is not allowed to leave the house hold	0. Disagree 1. Agree 99. Don't know Number of days the mother expected to stay in home= _____	
210	A woman should plan ahead of time where she will deliver her baby and how she will get there. Do you agree by this idea?	0. Disagree 1. Agree 99. Don't know	
211	A woman should plan ahead of time what she will do if she has a serious health problem related to pregnancy or childbirth. Do you agree by this idea?	0. Disagree 1. Agree 99. Don't know	
212	Do you think the following plans should be done by the women and family during her pregnancy in case she has a serious health problem related to pregnancy or childbirth?	No (0)	Yes (1)
	- Decide on facility - Save money - Make transport plans - Arrange for blood donor		
213	Can you name any danger signs during pregnancy, childbirth, or soon after delivery that indicate a woman has a serious health problem? IF YES: Which ones? PROBE: Anything else? RECORD ALL MENTIONED.	1. Excessive bleeding 2. Baby in bad position 3. Swelling of the hands or face 4. Convulsions/fits 5. Fever 6. Prolonged labor 7. Retained placenta 8. Foul vaginal discharge 9. Anemia 10. Leaking urine 11. Leaking stools Other (specify) _____ 99. Don't know	
214	Do you know of a place where a woman can go to deliver a baby with assistance from a doctor, nurse, or midwife? If YES: Where?	1. Gvt. Hospital 2. Gvt. Health center 3. Gvt. Health post 4. Private clinic Other(specify) _____ 99. Does not know facility	

SECTION 3: PREGNANCIES, BIRTHS AND STILLBIRTHS

Q.	Question and filters	RESPONSE CODE	SKIP
301	How many of your pregnancies resulted in a baby that was born alive? PROBE & ADD: Any baby who cried or showed signs of life but did not survive?	Total babies born alive	
302	Did you face any pregnancies result in a baby that was born dead (a stillbirth)?	0. No 1. Yes	
303	How many of your pregnancies resulted in a baby that was born dead?	Total babies born dead.....	

SECTION 4- PREGNANCY, DELIVERY, AND POSTPARTUM CARE EXPERIENCES

Use the name of the birth. If the baby was not named, enter „baby“. Ask the questions about the current birth (last birth). Begin with this statement: Now I would like to ask you some questions about the time before, during, and after the delivery of this birth.			
Q.	Question and filters	Response code	SKIP
401	When did the last pregnancy end?	Month Year	
402	How many months pregnant were you when the last such pregnancy ended?	Weeks	
403	What was the baby's condition in your last birth?	1. Born alive 2. Born dead	103
404	If born alive, ask name of baby.	NAME	
405	At the time you became pregnant with (NAME), did the pregnancy, wanted, mistimed or unwanted?	1. Wanted 2. Wanted but mistimed 3. Unwanted	407 407
406	How much longer would you have liked to wait?	Months..... Year..... 99. Don't know	
407	Did you use modern contraceptives to prevent this birth?	0. No 1. Yes	409
408	Which type of contraceptive you were using?	1. Pills 2. Injectables 3. IUCD 4. Condom Others (specify)-----	
Focused antenatal care			
409	Did you have any antenatal care in the previous births?	0. No 1. Yes	
410	When you were pregnant with (BABY'S NAME), did you have any antenatal care?	0. No 1. Yes	41 3
411	Do the following reasons contribute for none use of your antenatal care?	No(0)	Yes(1)
	- Respondent didn't think necessary - Husband/family didn't think necessary - Facility too far - No transport - No childcare - Too expensive - Services are poor - Used home remedy		

	- Did not know where to go - No time to go - Did not have any money			
412	Have you faced complications during pregnancy like preeclampsia and eclampsia, vaginal bleeding and severe anemia? Check and record	0. No 1. Yes 99. Don't know	454 478	
413	How many times in total did you receive antenatal care during this pregnancy?	Number of times..... 99. Don't know/can't remember		
414	Where did you receive antenatal care for this pregnancy?	1. Home 2. Govt. Hospital 3. Govt. Health center 4. Govt. Health post 5. Private clinic Other _____		
415	What kind of transport did you mainly use to get to the facility for your antenatal care visit? RECORD ONE RESPONSE ONLY.	1. Car 2. Motorbike 3. Public bus 4. Cart 5. Ambulance 6. On foot Other(specify) _____ 99. Don't know		
416	How long did it take to get there? Record in minutes and kilo meter. 1 Hour = 60 Min	Minutes Kilo meter..... 99. Don't know		
417	How long was the time between when you arrived at the facility and the time you were first examined by a health care provider?	Minutes 99. Don't know		
418	How many months pregnant were you when you went for your first antenatal care visit?	Months..... 99. Don't know/can't remember		
419	Whom did you see on your first visit?	1. Doctor 2. Health officer 3. Nurse/midwife 4. Health extension workers Other(specify) _____ 99. Don't know		
420	How many weeks pregnant were you when you last received antenatal care for this pregnancy?	Weeks..... 99. Don't know		
421	Whom did you see on your last visit?	1. Doctor 2. Health officer 3. Nurse/midwife 4. Health extension workers Other(specify) _____ 99. Don't know		
I would now like you to think about ALL of your visits when you were pregnant with (BABY'S NAME). During any of these visits, did the staff... (put a thick mark X)				
		No(0)	Yes(1)	DN(99)
422	Ask about your medical history?			
423	Measure blood pressure			
424	Measure weight			
425	Take a blood sample?			
426	Take a urine sample?			

427	Give you a TT (tetanus) immunization?				
428	Give you drugs to prevent malaria?				
429	Give you drugs to prevent anemia?				
430	Give you information or advice about diet and nutrition during pregnancy?				
431	Tell you your expected due date?				
432	Give you an update on how the baby is growing?				
433	Discuss the importance of planning or preparing for delivery?				
434	Discuss the items or supplies that will be needed during delivery (whether you deliver at home or in a health facility)?				
435	Discuss the place of birth?				
436	Advise you to give birth in a health facility?				
437	Discuss with you the importance of saving funds in advance for delivery?				
438	Discuss how other family members can assist in planning or preparing for delivery?				
439	Inform you of danger signs during pregnancy?				
440	Inform you of danger signs during delivery?				
441	Inform you of danger signs after delivery?				
442	Advise you about where to go for medical help if you have a problem during pregnancy or delivery, such as bleeding, swelling, convulsions or fits?				
443	Discuss how you would get to the health facility if there were an emergency?				
444	Discuss about potential blood donors				
445	Discuss the dangers of malaria during pregnancy?				
446	Talk about preventing and testing for HIV/AIDS?				
447	Talk about prevention of mother-to-child transmission of HIV?				
448	Talk about other sexually transmitted infections?				
When you were pregnant with (BABY'S NAME) did you discuss with your husband or family; about (put a thick mark <u>X</u>)					
449	Place of delivery?	No(0)	Yes(1)	DN(99)	
450	Type of transport to facility?				
451	Arrangements for a potential blood donor				
452	Save money for delivery?				
453	Expenses for antenatal care	Amount	Don't know(99)		
		Transport cost (round trip)			
		Payment for laboratory			
		Others			
		Total			
	Have you faced complications during pregnancy like preeclampsia and eclampsia, vaginal bleeding and severe anemia? Check and record	0 No 1 Yes 99. Don't know			454 478
Delivery and immediate post partum care					
454	How many months of gestation were for (BABY'S NAME) born?	Months..... 99. Don't know			

455	Did the birth weight of (BABY'S NAME) recorded?	0. No 1. Yes 99. Don't know			
456	If recorded, how much was it? Please write the birth weight in grams.	_____grams.			
457	Who assisted with the delivery of (BABY'S NAME)? Anyone else?	1. Doctor 2. Health officer 3. Nurse/midwife 4. TBA 5. Health extension worker 6. Relative/friend Others (specify) _____ 99. Don't know/can't remember			
I would now like you to think about ALL of the cares provided by your assistants when you deliver baby (BABY'S NAME). During your labor and delivery, did the assistants... (put a thick mark <u>X</u>)					
458		No(0)	Yes(1)	DN(99)	
	Ask about your medical history?				
	Measure vital signs and follow?				
	Perform vaginal examination and follow?				
	Perform an abdominal examination?				
	Auscultation of the fetal heart rate and follow?				
	Give you drugs to prevent bleeding?				
	Use the partograph ?				
	Give you information or advice about progress of labour and conditions of the fetus?				
	Advise and tried to make you comfortable?				
	Give care for the baby (resuscitation and keep warm)?				
	Measure and record baby weight?				
	Give vaccine for the baby?				
	Advise about breast feeding (early and exclusive)?				
	Advice on infant care?				
	Advise on nutrition				
Advise on family planning					
Inform your date of check up					
459	Where was the place you delivered your baby (BABY'S NAME)? NOTE: if delivery occurred on the way to the health facility, consider as "delivered at home or in community".	1. Delivered at a health facility 2. Delivered at home or in community			462
460	Do the following reasons contribute for your delivery at home/community?	No(0)	Yes(1)		
	- Respondent didn't think necessary - Husband/family didn't think necessary - Facility too far - No transport - No childcare - Too expensive - Services are poor - Used home remedy				

	- Did not know where to go - No time to go - Did not have any money																											
461	Expenses for delivery care at home	<table border="1"> <tr> <td></td> <td>Amount</td> <td>Don't know(99)</td> </tr> <tr> <td>To purchase supplies</td> <td></td> <td></td> </tr> <tr> <td>Others</td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td></td> <td></td> </tr> </table>		Amount	Don't know(99)	To purchase supplies			Others			Total																
	Amount	Don't know(99)																										
To purchase supplies																												
Others																												
Total																												
GO TO Q.468																												
Delivered at health facility																												
462	Who accompanied you to the facility? PROBE for the person(s) accompanying and record all persons.	0. No one 1. Woman(respondent) 2. Husband 3. Woman's mother/father 4. Other family members 5. Friend/neighbor 6. Health professional Other (specify) _____																										
463	What type of transport did you mainly use to get to the facility? RECORD ONE RESPONSE ONLY.	1. Car 2. Motorbike 3. Public bus 4. Cart 5. Ambulance 6. On foot Other(specify) _____ 99. Don't know																										
464	How long did it take to get there? RECORD IN MINUTES. 1 Hour = 60 Min	Minutes 99. Don't know																										
465	How long was the time between when you arrived at the facility and the time you were first examined by a health care provider? RECORD IN MINUTES. 1 Hour = 60 Min	Minutes 99. Don't know																										
466	Expenses for delivery care at health facility	<table border="1"> <tr> <td></td> <td>Amount</td> <td>Don't know(99)</td> </tr> <tr> <td>Transport cost</td> <td></td> <td></td> </tr> <tr> <td>To purchase supplies</td> <td></td> <td></td> </tr> <tr> <td>Payment for service</td> <td></td> <td></td> </tr> <tr> <td>Payment for laboratory</td> <td></td> <td></td> </tr> <tr> <td>Bed stay</td> <td></td> <td></td> </tr> <tr> <td>Others</td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td></td> <td></td> </tr> </table>		Amount	Don't know(99)	Transport cost			To purchase supplies			Payment for service			Payment for laboratory			Bed stay			Others			Total				
	Amount	Don't know(99)																										
Transport cost																												
To purchase supplies																												
Payment for service																												
Payment for laboratory																												
Bed stay																												
Others																												
Total																												
467	Do you think that the total amount you paid for the delivery was expensive, an appropriate amount, or inexpensive?	1. Expensive 2. Appropriate 3. Inexpensive																										
468	Check complications of labor/ delivery Like prolonged labor, convulsion, bleeding and fetal death?	0. No complication 1. Had a complication																										
Postnatal check up																												
469	In the six weeks after (BABY'S NAME) was born, did anyone check on yours and your baby's health?	0. No 1. Yes																										
470	Do the following reasons contribute for not having																											

	check up?	No(0)	Yes(1)	
	• Respondent didn't think necessary • Husband/family didn't think necessary • Facility too far • No transport • No childcare • Too expensive • Services are poor • Used home remedy • Did not know where to go • No time to go • Did not have any money			
GO TO Q.477				
471	How many days after delivery did you receive the first check up? Record _0' days if same day.	Days after delivery..... 99. Don't know		
472	Who did the check up?	1. Doctor 2. Health officer 3. Nurse/ midwife 4. TBA 5. HEW Other (specify)_____		
473	Where did this first check take place?	1. Home 2. Gvt. Hospital 3. Gvt. Health center 4. Gvt. Health post 5. Private clinic Other (specify)_____		
474	What kind of transport did you mainly use to get to the facility for your first postpartum care visit? Record one response only.	1. Car 2. Motorbike 3. Public bus 4. Cart 5. Ambulance 6. On foot Other(specify)_____		
I would now like you to think about ALL of the cares provided during your check up after delivery of baby (BABY'S NAME). During the check up, did the staffs.... (put a thick mark _X_)				
475		No(0)	Yes(1)	DN(99)
	Ask about your medical history?			
	Examine your abdomen?			
	Examine your breasts?			
	Perform vaginal examination?			
	Ask you about vaginal discharge?			
	Ask you about bleeding?			
	Discuss family planning?			
	Give a family planning method?			
	Give advice on breastfeeding?			
	Give advice on infant care?			
	Discuss and give infant immunization			

476	Expenses for postnatal care		Amount	Don't know(99)	
		Transport cost			
		To purchase supplies			
		Payment for service			
		Payment for laboratory			
		Others			
		Total			
477	Check for any complication in the postnatal period like bleeding, sepsis and fistula	0. No complication 1. Had a complication		478	
Care for pregnancy and delivery related complications					
478	What complications did you experience?	1. Bleeding 2. Swelling of body 3. Convulsion 4. Prolonged labor 5. Fetal death 6. Fever (sepsis) 7. Leakage of urine or stool (fistula) Others (specify)			
479	Did you seek any assistance for this problem?	0. No 1. Yes 99. Don't know			
	Do the following reasons contribute for not seeking assistance for this problem?	No(0)	Yes(1)		
480	- Respondent didn't think necessary (unable to judge severity) - Husband/family didn't think necessary - Facility too far - No transport - Too expensive - Services are poor - Used home remedy - Did not know where to go - No time to go - Did not have any money				
481	Whom did you see for the problem?	1. Doctor 2. Health officer 3. Nurse/midwife 4. TBA 5. Community health worker(HEW) 6. Relative/friend Other (specify)_____			
482	Who made the decision about whether or not you should go somewhere for assistance with this problem? Record one response only.	0. No decision made 1. Woman (Respondent) 2. Husband 3. Woman's mother/father 4. Other family members 5. Friend/neighbor 6. Health professional Other(specify)_____			

482	Did you go to a health facility for this assistance? IF YES: Which facility did you go to first?		1. Gvt. Hospital 2. Gvt. Health center 3. Gvt. Health post 4. Private clinic Other(specify)_____		
483	Have you accompanied when you go to the facility? If yes record person accompanying.		0 No 1 Yes Person(s) accompanying-----		
484	What kind of transport did you mainly use to get to the facility? Record one response only.		1. Car 2. Motorbike 3. Public bus 4. Cart 5. Ambulance 6. On foot Other(specify)_____		
485	How long did it take to get there? RECORD IN MINUTES. 1 Hour = 60 Min 2 Hours = 120 Min		Minutes..... 99. Don't know		
486	How long was the time between when you arrived at the facility and the time you were first examined by a health care provider? RECORD IN MINUTES. 1 Hour = 60 Min 2 Hours = 120 Min		Minutes..... 99. Don't know		
487	What was the major care provided at a health facility at the time you experienced this problem? PROBE: Anything else?		_____		
488	Expenses for care of complications		Amount	Don't know(99)	
Transport cost					
To purchase supplies					
Payment for service					
Payment for laboratory					
Bed stay					
Others					
Total					

Thank you very much for your valuable information!

Cluster information from Key informants

The key informants will be kebele administrators in order to get important community level information

Information sheet

Read the statements to the key informant

Purpose of the research project:

This study is one part of evaluating **skilled maternal care utilization in North Gondar zone. The main aim of this particular part is to explore community level information.**

Procedure: In order to collect our data, we invite you to take part in our project. If you are willing, you need to understand and sign the consent form.

Risk and /or discomfort: By participating in this research project you may feel some discomfort especially on sacrificing your time otherwise, no risk in participating in this research project, so your response provide an important input to show the gap and means to improve maternal health service.

Benefits: If you are participating in this research project, the output of the study will have both direct and indirect benefit to you, as you and your families will use the services in the future.

Incentives/payments for participating: You will not be provided any incentives or payment to take part in this project.

Confidentiality: Though the information collected from you is not personal, the information will be stored in a file, without your name, but a code number assigned to it. And it will not be revealed to anyone except the principal investigator and will be kept locked with key.

Right to refusal or withdraw: You have the full right to refuse from participating in this research. Your refusal will not affect you from getting any kind of health related service within the community.

Person to contact: If you want to know more information you can contact;

Ato Abebaw Gebeyehu by Tel: mobile 251-920314519 or

IRB of AAU by Tel: 251-115538734, e-mail: aaumfirb@yahoo.com

Consent Form

With due understanding of the aforementioned information, are you willing to participate in the study?

Yes

☐

Signature/finger print of the participant

Signature/finger print _____ date _____

(Proceed with the interview)

No

☐

Terminate the interview)

Signature of the interviewer

Name _____ Signature _____ date _____

Supervisors/Researcher remark and signature

Name _____ Signature _____ date _____

	District	Kebele	Key informant	Data collector
Name				
ID (code)				
Date of data collection			Time: from _____ to _____	
Responsibility in the kebele			Age: _____ Educational Level: _____	

ECONOMIC RELATED

Notes for the Interviewer: Identify the source of income and marketing systems

1. **What is the main means of income for the kebele population?**
2. **Does the production enough to feed the population (self sustained)?** Or do the kebele need food assistance in the non- cultivating seasons? How frequent (yearly, in some years)
3. **Where is the market place to sell productions? Where is the market place to buy household consumptions?** Is there any local market in the kebele?

COMMUNICATION AND TRANSPORTATION SYSTEM

Notes for the Interviewer: Explore the specific communication and transportation systems the villages are using

4. **What kind of communication system available in the kebele?** Do the villages have communication system? If there mention the type (mobile network, landline telephone). Does it work always?
5. **What kind of transportation villages used for labouring mothers?** In your kebele, do all villages have access for transportation?

Ask the respondent to list all villages

Which villages have and which villages have no connection to the main road? How long (far) are these villages from the nearest health center

Summarize using the following table

Villages in the kebele	Type of telephone network	Type of transportation villages used	Connection to the main road	Distance from the nearest health center
1				
2				
3				
4				
5				

HEALTH AND EDUCATION INFRASTRUCTURE

6. **What kind of health facility exists in the kebele? Record; name, type and number.**

Record the number of community health agents and traditional birth attendants in each village

Villages in the kebele	Number of traditional birth attendants	Numer of health extension workers	Number of community health agents
1			
2			
3			
4			
5			
Total			

7. **What kind of school is available in this kebele? Record; name, type and number.**

COMMUNITY SUPPORTING SYSTEMS

8. **Is there any community financing system in your kebele?** If there what?
9. **How the people will be helped each other?** How the “Edir” system (community level supporting organization) looks like in this area? Does it support pregnant women in case of complication?
10. **Do you have any traditional service or ceremonies provided for women during pregnancy and child birth?** If there what? How communities perform it?

Thank you very much for your valuable information!

In-depth interview guide for women, husband and elder female family influential

The interview will be conducted with individual women, husband or male family influential and elder female family influential about a woman who had normal delivery and postpartum recovery in the past 1 year.

Information sheet

Read the statements to the respondent

Purpose of the research project: This study is one part of evaluating **skilled maternal care utilization in North Gondar zone. The main aim of this particular part is** to explore the role of husbands", women and elder female family in the process of preparation and utilization of skilled maternal care.

Procedure: In order to collect our data, we invite you to take part in our project. If you are willing, you need to understand and sign the consent form.

Risk and /or discomfort: By participating in this research project you may feel some discomfort especially on sacrificing your time otherwise, no risk in participating in this research project, so your response provide an important input to show the gap and means to improve maternal health service.

Benefits: If you are participating in this research project, the output of the study will have both direct and indirect benefit to you, as you and your families will use the services in the future.

Incentives/payments for participating: You will not be provided any incentives or payment to take part in this project.

Confidentiality: The information collected from this research project will kept confidential and information about you that will be collected by this study will be stored in a file, without your name, but a code number assigned to it. And it will not be revealed to anyone except the principal investigator and will be kept locked with key.

Right to refusal or withdraw: You have the full right to refuse from participating in this research. Your refusal will not affect you from getting any kind of health related service within the community.

Person to contact: If you want to know more information you can contact;

Ato Abebaw Gebeyehu by Tel: mobile 251-920314519 or

IRB of AAU by Tel: 251-115538734, e-mail: aaumfirb@yahoo.com

Consent Form

With due understanding of the aforementioned information, are you willing to participate in the study?

Yes

☐

Signature/finger print of the participant

Signature/finger print _____ date _____

(Proceed with the interview)

No

☐

Terminate the interview)

Signature of the interviewer

Name _____ Signature _____ date _____

Supervisors/Researcher remark and signature

Name _____ Signature _____ date _____

	District	Kebele	Respondent	Data collector
Name				
ID (code)				
Type of respondent for the in-depth interview				
1. Women				
2. Husband/male family influential				
3. Elder female family influential				

Date of data collection _____	Time: from _____ to _____
Age of respondent: _____	Educational level of respondent: _____

Background information for the mother of our interest (known for the respondent)

District _____ Kebele _____	Number of families: _____
Educational Level: _____	Age: _____
Occupation: _____	Religion: _____
Delivery Date (approximate): -----months ago	Closest facility w/ surgical capacity: _____
Distance from facility _____ Km Cost of travel _____ Birr Duration of travel _____ Hours	Site of the delivery: (home/facility) Delivery assistant: (by self,, family/relative TBA, Health professional)
Distance of nearest TBA's home: _____	Gravidity _____ Parity _____ Live children _____

BIRTH PREPAREDNESS

Questions

1. **During the women (referred by the respondent) most recent pregnancy, what places for delivery did you discuss?** Who actually made the decision? Why this place is selected? If no discussion, Why not?
2. **What kind of preparation you made for childbirth?** Arrange transport? Set aside money? Other? How were each of these arrangements made? When were these arrangements made? Why were they made? Who else was involved? *If no preparation:* Why not?
3. **How much did you consider for the delivery cost for (mention each locations)?** Did you set aside any money or purchase any items in anticipation of the delivery? *If no:* why?
4. **Even if arrangements weren't made for this birth, what do you think should be done?** Of these preparations, which do you think you should be responsible for? Who else should be involved? When should these preparations be made? How should they be arranged?

SKILLED CARE AT CHILDBIRTH

Notes for the Interviewer: Explore preference of delivery place, attendant and cost barriers

5. **Where did (mention woman's name) deliver her last baby?** Why did she deliver there? *If births place other than home:* How was transportation arranged? How long did it take to get there? In your view, what is the best place for a woman to deliver? Why?
6. **Who assisted (mention woman's name) when she delivers her last baby?** How much you had satisfied by the attendants? In your view, who is the best person to provide care during labour and delivery? Why?
7. **How much did (mention woman's name)'s delivery costs?** Was it easy or difficult to pay delivery expenses? What did you do to cover this cost?

POSTPARTUM CARE

8. **Did (mention woman's name) go to a health facility for a check-up after her delivery?** If yes; Who did the check-up? When? Where? What did they do? *If no:* Why not?
Do you think it is important to go for a checkup in health facilities for a woman having normal delivery and a healthy baby? Why or why not?
9. **Can women leave the house whenever they want after childbirth?** How long? Why? Are there exceptions?

SKILLED CARE FOR OBSTETRIC EMERGENCIES

10. **Around here, what types of complications can women have?** Complications during pregnancy? During childbirth? After delivery?
Out of all these problems, which do you think are the most serious? Why?
11. **For (mention woman's name)'s most recent pregnancy, were any plans made in case problems like these occurred?** *If yes:* What? Why? Who was involved? *If no:* Why? Did you consider making a plan for an emergency? If so, what happened?

Say: Is there anything else that you would like to tell (me/ us)?

Thank you very much for your valuable information

In-depth interview guide for TBAs

This in-depth interview will be conducted with traditional birth attendant who has attended a delivery within the past one year.

Information sheet

Read the statements to the TBA

Purpose of the research project: This study is one part of evaluating **skilled maternal care utilization in North Gondar zone. The main aim of this particular part is to explore TBAs contribution and their views in the process of birth preparation and utilization of skilled maternal care.**

Procedure: In order to collect our data, we invite you to take part in our project. If you are willing, you need to understand and sign the consent form.

Risk and /or discomfort: By participating in this research project you may feel some discomfort especially on sacrificing your time otherwise, no risk in participating in this research project, so your response provide an important input to show the gap and means to improve maternal health service.

Benefits: If you are participating in this research project, the output of the study will have both direct and indirect benefit to you, as you and your families will use the services in the future.

Incentives/payments for participating: You will not be provided any incentives or payment to take part in this project.

Confidentiality: The information collected from this research project will kept confidential and information about you that will be collected by this study will be stored in a file, without your name, but a code number assigned to it. And it will not be revealed to anyone except the principal investigator and will be kept locked with key.

Right to refusal or withdraw: You have the full right to refuse from participating in this research. Your refusal will not affect you from getting any kind of health related service within the community.

Person to contact: If you want to know more information you can contact;

Ato Abebaw Gebeyehu by Tel: mobile 251-920314519 or

IRB of AAU by Tel: 251-115538734, e-mail: aaumfirb@yahoo.com

Consent Form

With due understanding of the aforementioned information, are you willing to participate in the study?

Yes

☐

Signature/finger print of the participant

Signature/finger print _____ date _____

(Proceed with the interview)

No

☐

Terminate the interview)

Signature of the interviewer

Name _____ Signature _____ date _____

Supervisors/Researcher remark and signature

Name _____ Signature _____ date _____

	District	Kebele	Respondent	Data collector
--	----------	--------	------------	----------------

Name				
ID (code)				
Date of data collection			Time: from to	
Age: Religion:			Educational level:	
TBA Training Status: (Untrained/trained)			Number of births assisted per month:	

BIRTH PREPAREDNESS

Notes for the Interviewer: Explore TBAs involvement and view on preparations that women and their families make for childbirth.

Questions

- 1. What preparations do women and their families make for childbirth?** Who is involved? When do they make these arrangements?
- 2. As a TBA, what do you do to help women prepare for childbirth?** What advice do you give them to create a safe birth plan? What advice do you give them to create a clean birth environment? How you discuss with women and/or their families to purchase any items or set money aside in advance?
- 3. Do you ever help prepare a pregnant woman to give birth in a health facility?**
If yes: What do you do? How do you advise her? *If no:* Why not? If a woman was planning to deliver in a health facility and asked for your assistance, would you be willing to help her?

SKILLED CARE AT CHILDBIRTH

Notes for the Interviewer: Explore TBAs role and their view on women preferences

- 4. What do you do to help women during delivery?**
How do you help her feel more comfortable? What procedures you apply to have clean birth? What action you can do to stop bleeding? How you keep the baby warm after birth?
- 5. In your opinion, where do women in your community prefer to give birth? Why?**
- 6. How would you describe the women in your community who prefer delivery with TBAs?** What do you think women like most about delivering with TBAs?
- 7. How would you describe the women in your community who prefer delivery by health professionals?**
What do they like most about delivering by health professionals?
- 8. What kinds of payment do you usually receive when you assist childbirth?** How much? Do women usually pay immediately? What do you do if they are too poor to pay?

POSTPARTUM CARE

Notes for the Interviewer: Explore current TBA practices and views on the post partum care

- 9. How long do you usually stay with the new mother after birth?** What do you do for the woman? For the new born?
- 10. How long and how often after delivery you follow (visit) the women whom you have assisted during childbirth?** What do you do during these visits? Do you think it is important to go for a checkup in health facilities for a woman having normal delivery and a healthy baby? Why or why not?

SKILLED CARE FOR OBSTETRIC EMERGENCIES

Notes for the Interviewer: Explore TBAs awareness and practice about obstetric complications

Say: Some women experience complications in late pregnancy, childbirth and the first weeks after delivery. It would be helpful to hear more about these problems.

- 11. Around here, what types of complications can women have?** Complications during pregnancy? During childbirth? After delivery?
Out of all these problems, which do you think are the most serious? Why?
- 12. What you usually do when complications occur?** Do you ever refer women to health facilities? How you did that? What is you advise for TBAs for such complications? Do you think the health facilities and staffs are appropriate to manage complications? Why?

Thank you very much for your valuable information!

In-depth interview guide for complications

This in-depth interview will be conducted with individual woman or group of family members (if mother is not available) for complication of a mother in the past one year.

Information sheet

Read the statements to the respondent (mother or her family members)

Purpose of the research project: This study is one part of evaluating **skilled maternal care utilization in North Gondar zone**. The main aim of this particular part is to provide a detailed, step-by-step analysis of actions performed for obstetric emergencies at different levels from the onset to its management.

Procedure: In order to collect our data, we invite you to take part in our project. If you are willing, you need to understand and sign the consent form.

Risk and /or discomfort: By participating in this research project you may feel some discomfort especially on sacrificing your time otherwise, no risk in participating in this research project, so your response provide an important input to show the gap and means to improve maternal health service.

Benefits: If you are participating in this research project, the output of the study will have both direct and indirect benefit to you, as you and your families will use the services in the future.

Incentives/payments for participating: You will not be provided any incentives or payment to take part in this project.

Confidentiality: The information collected from this research project will kept confidential and information about you that will be collected by this study will be stored in a file, without your name, but a code number assigned to it. And it will not be revealed to anyone except the principal investigator and will be kept locked with key.

Right to refusal or withdraw: You have the full right to refuse from participating in this research. Your refusal will not affect you from getting any kind of health related service within the community.

Person to contact: If you want to know more information you can contact;

Ato Abebaw Gebeyehu by Tel: mobile 251-920314519 or

IRB of AAU by Tel: 251-115538734, e-mail: aaumfirb@yahoo.com

Consent Form

With due understanding of the aforementioned information, are you willing to participate in the study?

Yes

☐

Signature/finger print of the participant

Signature/finger print _____ date _____

(Proceed with the interview)

No

☐

Terminate the interview)

Signature of the interviewer

Name _____ Signature _____ date _____

Supervisors/Researcher remark and signature

Name _____ Signature _____ date _____

	District	Kebele	Women (respondent)	Data collector
Name				
ID (code)				
Date of data collection _____			Time: from _____ to _____	
Educational Level of mother:			Age:	

Occupation:	Religion:
Delivery Date (approximate): -----months ago	Closest facility w/ surgical capacity:
Distance from facility _____ Km Cost of travel _____ Birr Duration of travel _____ Hours	Site of the delivery: (home/facility) Delivery assistant: (by self,, family/relative TBA, Health professional)
Distance of nearest TBA's home:	Gravidity _____ Parity _____ Live children _____
Type of complication:	

RECOGNITION OF OBSTETRIC COMPLICATIONS

Notes for the Interviewer: Explore on danger signs and household-level delaying factors

Say: Tell me about what happened when (you/ she) first developed a complication.

- 1. When were the signs of a problem first recognized?** Where was the place? Who recognized the problem first? Who else was there? Did everyone agree there was a problem?
- 2. What were the specific signs observed?** What was thought about the problem and its cause?
- 3. Was anything tried at home to solve the problem?** What was that? *Probe*

DECISION MAKING FOR CARE

Notes for the Interviewer: Explore the household and community level delays in seeking care

- 4. Who decided that the problem was so serious that (you/ she) needed to go outside of the home for help?** Did everyone else agree that (you/ she) needed help? How long did it take to reach this decision to seek help?
- 5. Where did you think you could go to solve the problem?** What were the places considered? What kind of help expected at each of those places? What was finally decided? Why was this place chosen? Who made that decision? Did everyone agree?
- 6. Once you decided to seek care, what arrangements were made before (you/ she) left the house?** How long did it take to make those arrangements? *Probe about all the preparations made (e.g. money, supplies, transport) and who did what.*

TRANSPORTATION

Notes for the Interviewer: Explore any difficulties and costs during transportation

- 7. How did (you/ she) reach (mention location)?** What kind of transportation did (you/ she) use? How long did it take to reach this place? Who was with (you/ her)? *Probe for transport difficulties, any delay on the way.*
- 8. How much did it cost to get there?** How you see the payment with your previous expectation? How did you pay: cash on hand, borrow, help from someone, other?

CARE IN THE FACILITY

Notes for the Interviewer: Explore the specific steps, quality and costs in receiving care

- 9. What happened when (you/ she) first reached (mention location)?**
Who was the first person talked to? What did they tell (you/ her)? Was anyone available to help (you/ her) here? Who? How much time did (you/ she) spend waiting before seeing someone?
- 10. What kind of help did (you/ she) receive here for this problem?** What did the providers do to try to manage (your/ her) problem?
- 11. How did you feel about the care (you/ she) received here?** Was there anything in particular that you liked or did not like about the care (you/ she) received?
- 12. How much did you pay for the care?** Were there any difficulties to meet these charges?
If the mother goes to another location, return to question 7 and continue the questions

FOLLOW UP CARE

- 13. After (you/ she) received treatment and the emergency was over, how long did (you/ she) stay in the facility?** How did (you/ she) get back home? What kind of transportation did (you/ she) use? How was it arranged? How much did it cost?
- 14. What kind of advice (you/ she) to take care of (your/ her) self at home?** Any advice to come back for check-up? When? From whom?
- 15. If this happened in your family again, would you do anything differently?**
What would you do differently and why?

Thank you very much for your valuable information

TOOLS FOR THE FACILITY BASED SURVEY

Facility based survey questionnaire

Information sheet

Read the statements to the facility manager (officer in charge of the facility)

Purpose of the research project: This study is one part of evaluating **skilled maternal care utilization in North Gondar zone. The main aim of this particular part is to measure availability and performance of facilities to provide skilled maternal care in the area.**

Procedure: In order to collect our data, we invite you to take part in our project. If you are willing, you need to understand and sign the consent form. We will ask some questions about performance status of your institution related to maternal services then we will continue to gather the remaining information whether important supplies and equipments are available and functional.

Risk and /or discomfort: By participating in this research project you may feel some discomfort especially on sacrificing your time otherwise no risk in participating in this study.

Benefits: If you are participating in this research project, the output of the study will have both direct and indirect benefit to you, as you and your families will use the services in the future.

Incentives/payments for participating: You will not be provided any incentives or payment to take part in this project.

Confidentiality: The information collected from this research project will kept confidential and information about you that will be collected by this study will be stored in a file, without your name, but a code number assigned to it. And it will not be revealed to anyone except the principal investigator and will be kept locked with key.

Right to refusal or withdraw: You have the full right to refuse from participating in this research. Your refusal will not affect you from getting any kind of health related service.

Person to contact: If you want to know more information you can contact;

Ato Abebaw Gebeyehu by Tel: mobile 251-920314519 or

IRB of AAU by Tel: 251-115538734, e-mail: aaumfirb@yahoo.com

Consent Form

With due understanding of the aforementioned information, are you willing to participate in the study?

Yes

☐

Signature/finger print of the participant

Signature/finger print _____ date _____

(Proceed with the interview)

No

☐

Terminate the interview)

Signature of the interviewer

Name _____ Signature _____ date _____

Supervisors/Researcher remark and signature

Name _____ Signature _____ date _____

	District	Facility	Facility head	Data collector
Name				
ID (code)				
Date of data collection _____			Time: from _____ to _____	

--	--

PART I Interview of facility manager (officer in charge of the facility)					Skip
101	What is your position?	1. Medical director 2. Head of the facility Other (specify): _____			
102	What is your qualification?	1. Specialist 2. Health Officer 3. General practitioner 4. Nurse Other (specify): _____			
103	What is the estimated catchment population served by this facility?	Total: _____ 99 Do not know			
104	In your estimation, how frequently do people from outside this facility catchment area seek care here?	1. Never 2. Rarely 3. Frequently 99 Do not know			
105	How many beds are there at this facility (including maternity)?	Total: _____			
106	How many maternity beds are there at this facility?	Total: _____			
107	What is the antenatal care coverage rate for this facility in the previous year?	_____ % 99. Do not know			
108	What is the delivery coverage rate for this facility in the previous year?	_____ % 99. Do not know			
109	What is the postpartum care coverage rate for this facility in the previous year?	_____ % 99. Do not know			
STAFFING					
At this facility how many of each of the following staff are employed and working?		Number of posts occupied:			
201	Physicians (both general medicine and obstetrician/gynaecologist)	Total: _____			
202	Health officers	Total: _____			
203	Nurses	Total: _____			
204	Midwives	Total: _____			
205	Health extension workers	Total: _____			
206	Anaesthetists	Total: _____			
207	Laboratory staff	Total: _____			
208	Pharmacists	Total: _____			
209	Sanitarians(ENV.H workers)	Total: _____			
210	Other (non-health worker staff—guards, cleaners, etc.)	Total: _____			
RECENT TRAINING IN MIDWIFERY					
211	How many staffs at this facility have received training in midwifery skills (in-service/continuing education) within the past twelve months?	Total: _____ 99. Do not know			
212	How many staff at this facility have received training in midwifery skills (in-service/ continuing education)	Total: _____ 99. Do not know			
	For the following types of training (in-service/ continuing education), Do staffs from this facility attended;	Within the past 12 months?		Within the past five years?	
		No (0)	Yes (1)	No (0)	Yes (1)
213	Life Saving Skills (LSS)				
214	Interpersonal communication/counseling				
215	Postabortion care (PAC)				

216	Infection Prevention (IP)					
217	Manual Vacuum Aspiration (MVA)					
218	Family Planning					
219	Record-keeping/HMIS					
220	PMTCT					
How many staff currently at this facility attended one or more of these trainings in the past five years? Ask about each category of provider separately for each type of training. If none, enter 0.						
221		Health officers	Nurses	midwives	Health extension workers	
222	LSS					
223	Communication/ counselling					
224	PAC/MVA					
225	Infection prevention					
226	Family planning					
227	PMTCT					
228	HMIS					
229	Have any staff who participated in LSS training left the facility? <i>If YES: How many? If none, write 0.</i>			Total: _____		
SERVICE PROVISION						
	Do the following services have been provided at least once within the past one month at this facility?			No (0)	Yes (1)	
301	Antenatal care					
302	Tetanus toxoid immunization					
303	Management of sexually transmitted diseases					
304	Normal delivery care					
305	Early postpartum check up (for mother) within 7 days					
306	6-week postpartum check up (for mother)					
307	Postpartum check up (for newborn/infant)					
308	Advice, support, and promotion of breastfeeding					
309	Newborn immunizations according to national immunization guidelines					
310	Family planning services					
311	VCT					
312	PMTCT					
	Do the following essential obstetric services have been provided at least once within the past three months at this facility?			No (0)	Yes (1)	
313	Administration of parenteral antibiotics					
314	Administration of parenteral oxytocics					
315	Administration of parenteral sedatives/anti-convulsants					
316	Manual removal of placenta					
317	Removal of retained products					
318	Assisted vaginal delivery/vacuum extraction					
319	Caesarean section					
320	Blood transfusion					
321	Management of ectopic pregnancy					
322	Management of ruptured uterus					
323	Voluntary termination of pregnancy					
	Do the following diagnostic procedures are routinely					

	carried out during every antenatal check-up?	No (0)	Yes (1)	
324	Detection of anemia/conduct pallor test			
325	Check blood pressure			
326	Check for signs of oedema			
327	Check for proteinuria			
328	Check for malaria			
329	Palpate abdomen for lie & fundal height			
330	Listen to the foetal heartbeat			
331	Test for syphilis			
332	Test for HIV/AIDS			
	Do the following preventive measures and counselling are routinely given during every antenatal checkup?	No (0)	Yes (1)	
333	Iron/folate supplementation provided			
334	Malaria prophylaxis provided			
335	Counseling on self-care during pregnancy			
336	Counseling on foods high in iron/folic acid			
337	Counseling on planning for delivery			
338	Counseling on signs of obstetric complications			
339	Counseling on early postpartum care after delivery			
340	Counseling on HIV/AIDS and PMTCT			
	Are all maternity care providers at this facility able to perform the following procedures?	No (0)	Yes (1)	
341	Use the partograph to monitor labour			
342	Perform active management of 3 rd stage of labour			
343	Suture/repair episiotomies			
344	Suture/repair vaginal tears			
345	Suture/repair cervical lacerations			
346	Perform manual removal of the placenta			
347	On average, in 10 deliveries in this facility, for how many do you think the partograph is used? <i>Tick best response.</i>	1. Not applicable - No deliveries conducted 2. Almost never (0 –1 in 10) 3. Rarely (2 - 4 in 10) 4. For half (5of the 10) 5. Most of the time (6-7) 6. Almost always (8+ in 10)		
348	When the partograph is not used to monitor labour, what are the main reasons it is not used?	Reasons 1. 2. 3. 99. Do not know		
	Are the following services/procedures routinely provided to women who come for postpartum care?	No (0)	Yes (1)	
349	Abdominal examination – check involution of uterus			
350	Vaginal examination – check for tears, infection, abnormal bleeding			
351	Counseling on maternal self-care during postpartum period			
352	Counseling on newborn care/breastfeeding			
353	Counseling on family planning			

354	What procedure is mainly used to treat incomplete abortion at this facility?	1. Services not provided 2. Dilatation and curettage 3. MVA	356 356
355	Why are PAC services not available at this facility?	Reasons 1. 2. 3.	
	Are the following services provided every day that this facility is open?	No (0)	Yes (1)
356	Antenatal care		
357	Normal delivery care		
358	Postpartum care services (for mother)		
359	Family planning services		
360	Postabortion care		
361	Diagnosis/treatment/counseling for sexually transmitted infections, including HIV/AIDS		
362	Child health services		
363	VCT		
364	PMTCT		
EMERGENCY SERVICES AND REFERRAL			
Select NO or YES answers for the following		No (0)	Yes (1)
365	Is a skilled attendant for maternity services available on site, 24 hours/day, 7 days/week? By –Skilled attendant” I mean a physician, Health officer, midwife or nurse.		
366	Is a skilled attendant for maternity services available on call 24 hours/day, 7 days/week?		
367	Are services for caesarean section available 24 hours/day, 7 days/week?		
368	Does this facility have a working ambulance or other means of transport in place to refer an obstetric emergency? If Yes, specify type of emergency transport system available		
369	Is the ambulance (or other mode of transport) in working condition at all times?		
370	Is the ambulance (or other mode of transport) fuelled at all times?		
371	Do facility uses service fees to cover costs of transport?		
372	Do client pay for costs of transport?		
373	Do facility and client split the cost of transport?		
374	What means of communication does your facility mainly use to call for transportation to refer an obstetric emergency?	1. None 2. Radio 3. Land line telephone 4. Mobile/Cell phone Other (specify): _____	
375	To what facility do you normally refer obstetric complications? <i>If facility does not refer cases, tick Not applicable and skip to Q.382.</i>	1. District hospital 2. Gondar hospital 3. Health centre Other (specify): _____ 99. Not applicable	382
376	How far is that facility, in kilometres? <i>Enter number of kilometres, one way.</i>	Kilometres: _____ 99. Do not know	

377	Which mode of transportation is most frequently used to transport obstetric emergencies to the referral site? <i>Do not read out list. Tick up one response.</i>	1. Car 2. Motorbike 3. Bus 4. Cart 5. Stretcher 6. On foot 7. Ambulance 8. Bicycle Other (specify): _____ 99. Do not know		
378	Does the referral site always have an obstetrician or physician having capacity to do surgery on duty?	0 No 1 Yes 99 Do not know		
379	Does the referral site always have a blood bank?	0 No 1 Yes 99 Do not know		
380	When you refer a case to another facility do you get feedback on the outcome of the case? <i>Tick best response.</i>	1. Never 2. Less than half of the time 3. More than half of the time 4. Always		
SUPERVISION				
381	When was the last time this facility received a supervisory visit from member(s) of the district health management team? <i>Do not read list out. Tick best response. If Never, go to Q.330.</i>	1. Never 2. In the past week 3. In the past month 4. In the past 3 months 5. In the past 6 months 6. In the past year 7. 1 year or longer 99 Do not know		395
	Do the supervisors perform the following during the last supervisory visit?	No (0)	Yes (1)	
382	Deliver drugs & supplies			
383	Assess availability of drugs, supplies and personnel			
384	Review facility record-keeping			
385	Gather data from service delivery records			
386	Assess status of facility (cleanliness, water availability, etc.)			
387	Assist staff in improving their performance			
388	Identify problems in service delivery/management			
389	Follow-up on problems identified during previous visit			
390	Provide feedback on facility performance			
391	Outlined a plan to resolve the problems			
392	Organized a training session/workshop			
393	Do you think the problems or deficiencies identified in the visits been resolved?			
FACILITY MANAGEMENT & ADMINISTRATION				
394	What is the main problem do staffs encounter in recording information on the care of maternity patients?	1. Staff do not have problems recording information 2. No stationery/blank records 3. Workload/insufficient staff time 4. Insufficient skills/knowledge among		

		staff Other (specify): _____ 99 Do not know	
395	To the best of your knowledge, how is the information in the registers used?	specify: _____	
396	How often do you receive feedback on service delivery data sent to the district level?	1. Never 2. Monthly 3. Every three months (quarterly) 4. Twice a year 5. Once a year (annually) Other (specify): _____	
397	Is information on maternal deaths recorded and routinely reported? <i>If no maternal deaths have occurred at the facility, skip to Q.401.</i>	0 No 1 Yes No maternal deaths have occurred at the facility Go to →	401
398	Are maternal deaths routinely investigated at this facility?	0 No 1 Yes	
LOGISTICS			
401	In the past 12 months has this facility ever run out of drugs and medical supplies?	0 No 1 Yes 99. Don't know	
402	How are the quantities of drugs and medical supplies needed by this facility determined? <i>Listen carefully. Do not read out list. Tick one best response.</i>	1. Quantities determined at national level (e.g. standard drug kit) 2. Quantities determined at district level 3. Quantities determined through supervisory visits 4. Quantities determined by facility staff Other (specify): _____	
403	How is it determined when drugs/supplies should be reordered? <i>Listen carefully. Do not read out list. Tick one best response.</i>	1. Never re-order, new supply/drug kits arrive 2. Re-order whenever stocks reach "re-order level" 3. Re-order when supplies run out 4. Re-order at regular intervals (ex: every month or quarter) Other (specify): _____	
404	Are maternity clients required to purchase/provide supplies/drugs at time of delivery?	0 No 1 Yes	
	Are maternity patients required to purchase/provide the following supplies?	No(0)	Yes(1)
405	Gloves		
406	IV solutions		
407	Suture material		
408	Soap		
409	Medications/Medicine		
410	Sanitary pads		
411	Antiseptic liquid		
412	Blood		
413	Powder		
414	Gauze/cotton		
415	Where do maternity clients and/or their families usually purchase drugs, supplies, etc.,	1. Pharmacy within the facility 2. Pharmacy just outside the facility	

	that are required for delivery care (normal or complicated delivery)?	3. Pharmacy within community Other (specify): _____		
		99. Do not know		
	Did the facility consider the following if a client and/or her family cannot afford to pay for services/purchase necessary items for normal or complicated delivery care?	No(0)	Yes(1)	
416	Services will not be provided			
417	Only emergency services are provided			
418	All services are provided free of charge to patient who cannot pay			
419	Services are provided, based on arrangements /agreements that charges/ fees will be paid on discharge			
420	Services are provided at reduced rate/fee			
421	Arrange an emergency loan fund that maternity patients can access if needed to purchase supplies, drugs, etc.?			
CLINICAL MANAGEMENT GUIDELINES & PROTOCOLS				
	Are the following types of maternal health service delivery guidelines/clinical management protocols; 1) are available at the facility? 2) clearly outline steps in management of complication?	Available		clearly outline steps of management
		No(0)	Yes(1)	No(0) Yes(1)
422	Clinical guidelines for diagnosis & treatment of common diseases			
423	Family planning guidelines for service providers			
424	Life saving skills: self directed learning guide			
425	Clinical flowcharts on obstetric complications			
426	National guidelines for quality obstetrics and perinatal care			
427	National guidelines on medical management of rape and sexual violence			
428	Are these guidelines/protocols available for reference by staff at all times? <i>If NO: Why not?</i>	1. No, they are locked for safe keeping 2. No, staff keep them in their homes 3. Yes other (specify): _____ 99 Do not know		
In your opinion, what are the two greatest problems facing this health facility right now? What are the solutions to these problems?				
429	Problems	Solutions		
	In your opinion, what are the two greatest obstacles to increasing the proportion of births attended by staff with midwifery qualifications?			
430	Obstacles	Solutions		

LABORATORY SERVICES EQUIPMENT & REAGENTS					
	Which of the following services; <i>Request to interview laboratory staff if available. Ask about each service separately.</i>	Are available at this facility?		Provided within the past week?	
		No(0)	Yes(1)	No(0)	Yes(1)
431	Syphilis testing (VDRL) <i>If not provided why?</i>				
432	Blood test—Haemoglobin <i>If not provided why?</i>				
433	Urinanalysis/proteinuria <i>If not provided why?</i>				
434	Blood test—Malarial parasites <i>If not provided why?</i>				
The interview portion of this instrument is now complete. The remaining sections should be completed through observation.					
PART II OBSERVATION					Skip
INFRASTRUCTURE AND EQUIPMENT					
Which of the following items are available and in satisfactory condition? <i>Be sure to look at each item. Code as unsatisfactory items which in your judgment are not functional, have missing parts, are unhygienic, or otherwise sub-standard.</i>					
501	Examination room or area providing client privacy (room for screening, counseling, and examination)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory			
502	Examination table	0 Not available 1 Available but not satisfactory 2 Available and satisfactory			
503	Adjustable stool or seat	0 Not available 1 Available but not satisfactory 2 Available and satisfactory			
504	Storage area or cupboard for drugs and other supplies	0 Not available 1 Available but not satisfactory 2 Available and satisfactory			
505	Toilet facilities or latrine	0 Not available 1 Available but not satisfactory 2 Available and satisfactory			
506	Delivery or labour room	0 Not available 1 Available but not satisfactory 2 Available and satisfactory			
507	Delivery bed/couch	0 Not available 1 Available but not satisfactory 2 Available and satisfactory			
508	Blood bank	0 Not available 1 Available but not satisfactory 2 Available and satisfactory			
509	Refrigerator	0 Not available 1 Available but not satisfactory 2 Available and satisfactory			
510	Water supply	0 Not available 1 Available but not satisfactory 2 Available and satisfactory			
510	Which of the following does the labour room usually have for light supply?	1. None 2. Electricity			

		3. Candles 4. Kerosene lamp 5. Battery torch with working batteries available 6. Generator 7. Solar power Other (specify): _____ 99 No labour room	
511	What is the main power source for this facility?	1. None 2. Electricity (grid) 3. Electricity (generator) 4. Solar Other (specify): _____	
512	What is the main water source for this facility?	1. Running tap in/at facility 2. Well within 50 metres of facility 3. Well within 500 metres of facility 4. Rainwater Other (specify): _____	
513	Does the labour room have adequate drainage?	0 No 1 Yes	
	Does this facility sterilize its equipment using the following techniques?	No(0)	Yes(1)
514	Autoclave/steam/vapor		
515	Dry Oven		
516	Boiling		
517	Chlorine/Jik		
BASIC EQUIPMENTS			
Which of the following items are available and in satisfactory condition? <i>Be sure to look at each item.</i>			
601	Blood pressure apparatus (sphygmomanometer)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
602	Stethoscope	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
603	Infant weighing scale	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
604	Adult weighing scale	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
605	Fetal stethoscope	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
606	Sterilizer	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
607	Clinical oral thermometer	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
608	Manual vacuum aspirator (MVA) set	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
609	Dilatation & curettage (D&C) set	0 Not available	

		1 Available but not satisfactory 2 Available and satisfactory	
610	Protective clothing (shoes, aprons)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
611	Speculum (various sizes)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
612	Vacuum extractor	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
613	Obstetric forceps	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
614	Tape measure	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
615	Stop watch/clock with second hand	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
616	Containers with lids to store boiled instruments, gloves, etc.	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
617	Containers with lids for disposal of sharps	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
618	Oxygen tank, tubing & face mask or nasal canula	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
619	Straight catheter	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
620	Foley catheter & urine collection bags	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
621	Tourniquets	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
622	Stretchers	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
Absolute minimum equipment for delivery			
623	Delivery set (cord scissors, cord clamp, 2 mayo clamps)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
624	Scissors (for episiotomies)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
625	Suture needles and suture material (ligatures)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
626	Needle holder, long	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	

Absolute minimum for care of neonate			
627	Cloth or towel to dry/wrap baby	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
628	Bag and mask for neonatal resuscitation	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
Equipment for postabortion care			
629	Examination table with stirrups	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
630	Manual vacuum aspirator (MVA) set – single valve	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
631	Manual vacuum aspirator (MVA) set – double valve	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
632	Valve set replacement	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
633	Spare syringe seals (o-rings)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
634	MVA cannula set (4 mm – 12 mm)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
635	Sponge holding or ring forceps (ovum forceps) (2)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
645	Uterine tenaculum or vulsellum forceps	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
636	Dilatation & curettage (D&C) set	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
637	Container or basin (for tissue inspection)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
638	Lockable storage area or cupboard for PAC equipment	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
Educational materials			
701	What types of client information, education and communication (IEC) materials are available today for maternal health care?	Specify: 1. 2. 3.	
Which of the following IEC and/or counseling materials are available? <i>Be sure to look at each material to determine whether or not the following topics are covered.</i>			
702	On warning signs of complications in pregnancy	0 Not seen 1 Seen at this facility	
703	On planning for delivery/birth preparedness	0 Not seen 1 Seen at this facility	
704	On facility delivery	0 Not seen 1 Seen at this facility	

705	On newborn care or breast-feeding	0 Not seen 1 Seen at this facility	
706	On postpartum care (self-care following delivery)	0 Not seen 1 Seen at this facility	
707	On family planning	0 Not seen 1 Seen at this facility	
708	On postabortion care (self-care, postabortion, family planning)	0 Not seen 1 Seen at this facility	
709	On sexually transmitted infections/HIV/AIDS	0 Not seen 1 Seen at this facility	
710	On antenatal nutrition or anaemia	0 Not seen 1 Seen at this facility	
711	On PMTCT	0 Not seen 1 Seen at this facility	
712	On other maternal health topics (specify)	0 Not seen 1 Seen at this facility	
ESSENTIAL DRUGS AND CONSUMABLE SUPPLIES			
<i>For essential drugs and consumable supplies, be sure to look at each item, to see if it is available, is in good condition and has not expired.</i>			
Consumable supplies			
801	Gloves	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
802	Disposable syringes and needles	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
803	Oxygen	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
804	IV kit	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
805	IV catheter sets	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
806	Blank partographs	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
807	Blank Mother's Cards	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
808	Cord ties	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
809	Blood giving sets	0 Not available 1 Available but not satisfactory 3 Available and satisfactory	
810	Blood bags	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
811	Anti-sera (drug)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
812	Sterile packing material or sterile sanitary pads	0 Not available 1 Available but not satisfactory	

		2 Available and satisfactory	
813	Sterile gauze pads or swabs	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
814	Urine dip stick/albumin dip sticks	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
815	HIV test kits	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
Drugs (Anaesthetics, Analgesics)			
816	Nitrous oxide or other general anaesthetic agent	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
817	Ketamine (injection)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
818	Atropine	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
819	Lidocaine 2% or other	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
820	Pethidine	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
821	Paracetamol	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
Drugs (Anti infective, anti hypertensive)			
822	Ampicillin (capsules or injection)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
823	Benzathine benzylpenicillin or procaine benzylpenicillin (injections)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
824	Procaine penicillin	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
825	Metronidazole	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
826	Ceftriaxone (injection) or ciprofloxacin (capsule)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
827	Gentamicin (injection)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
828	Erythromycin	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
829	Co trimoxazole	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	

830	Tetracycline (ointment) or silver nitrate (eye drops) (for neonate)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
831	Chloroquine (tablets)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
832	Quinine (injection)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
833	Nevirapine (NVP)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
834	Zidovudine (ZDV)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
835	Efavirez (EFV)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
836	Nelfinavir (NFV)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
837	Lamivudine (3TC)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
838	Stavudine (d4T)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
839	Ferrous sulphate + folic acid (in combined form or separately)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
840	Methyldopa or propranolol or any other antihypertensive	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
841	Hydralazine (injection)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
842	Diazepam (injection)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
843	Magnesium sulfate (injection)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
Drugs (Contraceptives, Vaccines and others)			
844	Oral contraceptives (any type)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
845	Injectable contraceptives (any type)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
846	Condoms	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
847	IUCDS/IUDS	0 Not available	

		1 Available but not satisfactory 2 Available and satisfactory	
848	Implants	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
849	Emergency contraceptive pills	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
850	Tetanus toxoid (injection) stored in refrigerator	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
851	Tetanus antitoxin (antitetanus immunoglobulin: human)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
852	BCG vaccine (injection)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
853	Polio Vaccine (Oral)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
854	Ergometrine (injection or tablets)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
855	Oxytocin (injection)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
Drugs (Intravenous solutions)			
856	Sterile water for injection	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
857	Sodium chloride/saline solution	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
858	Sodium lactate compound solution (Ringer's lactate)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
859	Glucose with sodium chloride	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
860	Plain glucose solution	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
Which of the following items are available and in satisfactory condition? <i>Be sure to look at each item separately. Use your judgment if items are not functional, have missing parts, etc.</i>			
901	Microscope	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
902	Test tubes	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
903	Slides	0 Not available 1 Available but not satisfactory	

		2 Available and satisfactory	
904	Centrifuge for hematocrits or haemoglobinometer for haemoglobin checks	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
905	Cross match tests	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
906	Coagulation tests	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
907	Serology tests (VDRL)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
908	Bacteriological tests (sexually transmitted infection diagnosis)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
909	Hydrochloric acid	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
910	Acetic acid	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
Disinfectants, antiseptics & cleansers			
911	Alcohol	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
912	Iodine	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
913	Chlorhexidine	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
914	Soap	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
915	0.5 chlorine solution (bleach/JIK)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	
916	Formaldehyde (8%) or Glutaraldehyde (2%)	0 Not available 1 Available but not satisfactory 2 Available and satisfactory	

Maternal care providers' questionnaire

Information sheet

Read the statements to the care provider

Purpose of the research project: This study is one part of evaluating **skilled maternal care utilization in North Gondar zone**. The main aim of this particular part is to measure availability and performance of facilities to provide skilled maternal care in the area.

Procedure: In order to collect our data, we invite you to take part in our project. If you are willing, you need to understand and sign the consent form.

Risk and /or discomfort: By participating in this research project you may feel some discomfort especially on sacrificing your time otherwise no risk in participating in this study.

Benefits: If you are participating in this research project, the output of the study will have both direct and indirect benefit to you, as you and your families will use the services in the future.

Incentives/payments for participating: You will not be provided any incentives or payment to take part in this study.

Confidentiality: The information collected from this research project will kept confidential and information about you that will be collected by this study will be stored in a file, without your name, but a code number assigned to it. And it will not be revealed to anyone except the principal investigator and will be kept locked with key.

Right to refusal or withdraw: You have the full right to refuse from participating in this research.

Person to contact: If you want to know more information you can contact;

Ato Abebaw Gebeyehu by Tel: mobile 251-920314519 or

IRB of AAU by Tel: 251-115538734, e-mail: aaumfirb@yahoo.com

Consent Form

With due understanding of the aforementioned information, are you willing to participate in the study?

Yes

☐

Signature/finger print of the participant

Signature/finger print _____ date _____

(Proceed with the interview)

No

☐

Terminate the interview)

Signature of the interviewer

Name _____ Signature _____ date _____

Supervisors/Researcher remark and signature

Name _____ Signature _____ date _____

	District	Facility	Care provider	Data collector
Name				
ID (code)				
Date of data collection _____			Time: from _____ to _____	
Q.	Question and filters	RESPONSE CODE		SKIP
101	Gender of respondent	• Male • Female		
102	What is your age?	Years: _____		
103	What is your qualification? <i>Do not read list out. Tick one response.</i>	1. Doctor 2. Health Officer 3. Nurse/midwife 4. Health extension workers Other (specify): _____		
104	When did you start working at this	Date: _____		

	facility?					
TRAINING & EXPERIENCE						
201	In what year did you complete your pre-service training?	Year: _____				
202	How long was your pre-service training?	99. Do not know/remember				
203	When you received your most recent training in midwifery (either pre-service or in-service), did it include "hands-on" practical training?	_____ years				
		1. No 2. Pre-service 3. In-service 4. Pre- and in-service				
	For the following types of training (inservice/ continuing education), Do you have attended within the past 12 months?	No (0)		Yes (1)		
204	Life Saving Skills (LSS)					
205	Interpersonal communication/counseling					
206	Postabortion care (PAC)					
207	Infection Prevention (IP)					
208	Manual Vacuum Aspiration (MVA)					
209	Family Planning					
210	Record-keeping/HMIS					
211	PMTCT					
212	Focused ANC					
	From your training or on-the-job experience, which of the following skills have you learned/acquired? <i>Read aloud each skill, and if respondent answers Yes, ask if she/he has used the skill within the past 3 months. If a skill has not been learnt, move to the next skill.</i>	Have learned to:		Used this skill within last 3 months?		
		No (0)	Yes (1)	No (0)	Yes (1)	
213	Perform antenatal risk screening					
214	Use partograph to monitor labour progress					
215	Start IV infusion					
216	Perform speculum examinations					
217	Perform bimanual examinations					
218	Bimanually compress uterus					
219	Perform external versions					
220	Perform internal versions					
221	Suture (repair) episiotomies					
222	Suture (repair) cervical lacerations					
224	Suture (repair) vaginal tears					
225	Suture (repair) 3rd/4th degree tears					
226	Perform active management of third stage of labour					
227	Perform manual removal of placenta					
228	Perform vacuum extraction					
229	Perform manual vacuum aspiration to evacuate the uterus					
230	Perform dilatation and curettage					
231	Have you routinely perform the following steps/check-ups to women who present for antenatal care?	No (0)		Yes (1)		
232	Detection of anemia					
233	Check blood pressure					

234	Check for signs of edema			
	Check for proteinuria			
235	Check for malaria			
236	Listen to the fetal heart beat Palpate abdomen for lie & fundal height			
237	Take medical history			
238	Provide iron/folate supplementation			
239	Provide malaria prophylaxis			
240	Test for syphilis			
241	Counsel on self-care			
242	Counsel on planning for delivery			
	Have you discussed the following topics individually with women during their antenatal care visits?	No (0)	Yes (1)	
243	Foods high in iron/folic acid			
244	Expected due date			
245	Preferred birth location			
246	Preferred birth attendants			
247	Knowledge of location of closest health facility			
248	Obtaining funds for birth-related expenses			
249	Arranging transport in case of obstetric emergencies			
250	Signs of complications			
251	Identifying compatible blood donors			
252	Importance of early postpartum care after delivery			
253	HIV prevention and testing			
254	PMTCT			
255	Generally, how frequently are you able to check on women during labour? <i>Tick the best response.</i>	1. Every 10-15 minutes 2. Every 30 minutes 3. Every hour (60 minutes) 4. Whenever they call Other (specify): _____		
256	Do you usually use the partograph to monitor labour?	0 No 1 Yes		
257	On average, in 10 deliveries, for how many do you think you would generally use the partograph? <i>Tick the best response.</i>	1. Almost never (0-1 in 10) 2. Rarely (2-4 in 10) 3. About half the time (5 in 10) 4. Most of the time (6-7 in 10) 5. Almost always (8+ in 10) Other (specify): _____		
Now, I would like to ask you some questions about the care you provided during the most recent delivery you attended				
258	Did you introduce yourself to your client when she came for delivery?	0 No 1 Yes		
259	Did you ask your client if she had any questions or concerns?	0 No 1 Yes		
260	Did you ask the client if she wanted a family member or other person with her for support during labour?	0 No 1 Yes		
261	When you examined the woman, did you	0 No/Nothing		

	provide privacy? <i>If YES: What did you use to provide privacy to the client? Record all mentioned.</i>	1 Ward screen 2 Cloths/drapes to cover body Other (specify): _____	
262	Did you explain what you were doing before you examined the client and before any procedure?	0 No 1 Yes	
263	Did you inform the client of her progress during labour and her medical condition?	0 No 1 Yes	
264	Did you explain to the client what she should expect during labour and delivery?	0 No 1 Yes	
265	Did you offer any advice on how she could make herself more comfortable during labour and delivery?	0 No 1 Yes	
266	If you attended deliveries at a place other than this facility, where were they conducted?	1. At another health facility 2. At a private practice 3. At a client's home/in the community Other (specify): _____	
267	After a normal delivery, do you advise women that they should return for a check-up after delivery? <i>If Yes: When do you tell her she should return for a check-up? Do not read out list. Tick one best response.</i>	1. Never/do not advise 2. During first week 3. During first six weeks 4. Only if she is ill/in case of problem Other (specify): _____	
268	Have you routinely perform the following steps/check-ups to women who come for postpartum care?	No (0)	Yes (1)
269	Perform an abdominal examination		
270	Perform a vaginal examination		
271	Take blood pressure		
272	Ask about abnormal bleeding		
273	Inspect lochia		
274	Discuss family planning		
275	Advise about breast-feeding		
276	Examine baby		
277	Advise on care of the baby		
278	Provide iron/folate supplementation		
MANAGEMENT OF COMPLICATIONS			
301	Do women with obstetric complications generally reach this facility in a timely manner (i.e. they arrive in time for effective treatment)? <i>Do not read out list. Tick one best response.</i>	1. Never 2. Less than half the time 3. More than half the time 4. Always 99. Do not know	
302	In an emergency, are you able to call the district hospital?	0 No 1 Yes	
303	Does the ambulance come when you call for it? <i>Probe to find out if and when the ambulance is available. Tick the best response.</i>	0. No 1. Yes, always 2. Only during the day Other (specify): _____	
304	How long does it take usually? <i>Tick the best response.</i>	1. 30 minutes or less 2. 30 minutes-1 hour 3. 1-2 hours	

		4. 2-3 hours 5. 3-6 hours 6. 6-12 hours 7. More than 12 hours	
305	Are patients able to pay for the required fees?	0 No 1 Yes	
306	After referring a woman to higher-level facilities, do you get information on the outcome of the case?	0 Never 1 Sometimes 2 Always	
	Have you performed the following for a pregnant woman comes with signs of pre-eclampsia (swollen hands and feet headaches, elevated blood pressure)?	No (0)	Yes (1)
307	Prepare the woman for referral/refer		
308	Take the woman's blood pressure		
309	Check the woman's urine for proteinuria		
310	Do reflex testing		
311	Give the woman an analgesic (e.g. aspirin)		
312	Keep the woman quiet and away from activity		
313	Prepare a tongue blade in case of seizure		
314	Administer antihypertensive		
315	Administer anticonvulsant		
316	Transport the woman to the nearest hospital/doctor		
317	Tell her to return in 24 hours		
318	Others (specify)		
	Have you performed the following for obstructed or prolonged labour?	No (0)	Yes (1)
319	Prepare the woman for referral/refer		
320	Continue monitoring with partograph		
321	Prepare the woman for Caesarean section		
322	Set IV infusion		
323	Blood grouping and cross-matching		
324	Administer parenteral antibiotic therapy		
325	Prepare neonatal resuscitation facilities		
	Do you agree on the following possible complications of obstructed/prolonged labour?	No (0)	Yes (1)
326	Infection		
327	Rupture of uterus		
328	Trauma to the bladder/rectum resulting in VVF/RVF		
329	Maternal death		
	Others (specify)		
	Have you performed the following for a woman passes more than 500 ml of blood from the genital tract shortly after delivery?	No (0)	Yes (1)
330	Prepare the woman for referral/refer		
331	Call for help		
332	Massage the fundus		

333	Give ergometrine IM or IV			
334	Empty the woman's bladder			
335	Examine the woman for lacerations of the perineum, vagina and cervix			
336	Start IV fluids			
337	Take blood for grouping and cross-matching			
	Have you performed the following if the cause of bleeding is retained placenta?	No (0)	Yes (1)	
338	Prepare the woman for referral			
339	Controlled cord traction			
340	Give oxytocin			
341	Manually remove placenta			
342	Watch for signs of shock			
343	Do vaginal examination			
	Other (specify):			
	Have you performed the following in the management of post abortion patients?	No (0)	Yes (1)	
344	Uterine evaluation (e.g. perforated, tender)			
345	Identification of cervical laceration or signs of trauma			
346	Prevention of infection			
347	Administration of antibiotics			
348	Management of complications			
349	Post-abortion family planning counseling/contraception			
350	Referral to other reproductive health services as appropriate			
351	Information/counselling/support for patient/family			
352	Uterine evacuation by MVA			
353	Uterine evacuation by D & C			
	Other (specify):			
General questions				
401	Generally, do you feel as though you have the knowledge and skills you need to do your job well?	0 No 1 Yes 99. Do not know		
402	Generally, do you feel as though you have the equipment and supplies you need to do your job well?	0 No 1 Yes 99. Do not know		
403	Generally, do you feel as though you have the supervisory support to do your job well?	0 No 1 Yes 99. Do not know		
404	Are you happy in your job? <i>Probe and tick the best response.</i>	0 No 1 Yes 99. Do not know		
405	Do you have any suggestions for improving the working environment and staff morale at this facility?			

Thank you very much for your valuable information!

TOOLS FOR THE FOLLOW UP STUDY

INSTRUCTION FOR THE DATA COLLECTORS

Please follow these steps throughout the follow up period

Step 1: Identify pregnant women in the selected Kebeles

The households are already under the demography and health survey sites. Use the community health workers and all other options to identify pregnant women.

Step 2: Get consent for inclusion in the follow up

Once pregnant women are identified, read the consent statement and get their agreement

Step 3: Record background information and give appointment

Count the gestational age and arrange appointment within the 9th month of pregnancy

Step 4: Do the first evaluation

The first evaluation will be done at the last month of her gestational age. If the pregnant women identified at 9th month of gestation, both background information and the first evaluation will be recorded. Inform the women that she will have another visit within 1 week after delivery.

Step 5: Do the second evaluation

The cohorts will have second evaluation immediately after delivery (within 1 week)

After filling the evaluation assessment tool, do arrangements for the last evaluation that will be after 6 weeks of delivery.

Step 6: Do the third evaluation

This evaluation will be the last. All the information will be recorded in the check list. This can be done at health institutions or at the outreach sites if women come for immunization.

Special cases:

Pregnant women end up with abortion will not have further follow-up except the first evaluation (recorded as follow-up interrupted by abortion in the 2nd & 3rd evaluation)

Pregnant women with still birth (pregnancy loss after 28 weeks of gestation) and pregnant women having preterm birth will have 2nd & 3rd evaluation but the first evaluation may be lost because of the timing. Therefore first and second evaluation will be conducted together by excluding some questions not applicable for the time.

GETTING CONSENT

Information sheet

Read the statements to the pregnant mother

Purpose of the research project: This study is one part of evaluating skilled maternal care utilization in North Gondar zone. The main aim of this particular part is to evaluate immediate effects of using or not using skilled maternal care on the health of mothers and their baby. This will provide valuable information to health care planners to design evidence based intervention.

Procedure: In order to accomplish the project, we invite you to take part in our project. If you are willing, you need to understand and sign the consent form. This study is a follow up study. You will be visited three times, during your pregnancy, within one week of delivery and at 6 weeks of your delivery.

Risk and /or discomfort: By participating in this research project you may feel some discomfort especially on sacrificing your time otherwise, no risk in participating in this research project. **Benefits:** If you are participating in this research project, the output of the study will have both direct and indirect benefit to you, as you and your families will use the services in the future. If field workers identify any danger signs or morbidities on you or your baby, you will discuss together to go to health institutions for necessary managements.

Incentives/payments for participating:

You will not be provided any incentives or payment to take part in this project.

Confidentiality: The information collected from this research project will kept confidential and information about you that will be collected by this study will be stored in a file, without your name, but a code number assigned to it. And it will not be revealed to anyone except the principal investigator and will be kept locked with key.

Right to refusal or withdraw: You have the full right to refuse from participating in this research. Your refusal will not affect you from getting any kind of health related service within the community.

Person to contact: If you want to know more information you can contact Ato Abebaw Gebeyehu by Tel: mobile 0920314519 or

IRB of AAU by Tel: 251-115538734, e-mail: aaumfirb@yahoo.com

Consent Form

With due understanding of the aforementioned information, are you willing to participate in the study?

Yes

☐

Signature/finger print of the participant

Signature/finger print _____ date _____

(Proceed with the interview)

No

☐

Terminate the interview)

Signature of the interviewer

Name _____ Signature _____ date _____

Supervisors/Researcher remark and signature

Name _____ Signature _____ date _____

BACKGROUND INFORMATION

	District	Kebele	HH head	Women	Data collector
Name					
ID (code)					
Gestational date in weeks _____					
Date of data collection _____			Time: from _____ to _____		

Q.	Question and filters	Response code	SKIP
1	How long have you been living continuously in this Kebele?	Years Always	
2	In what month and year were you born?	Month..... Year 99. Don't know	
3	What is your educational level?	1. Illiterate 2. Elementary(1-6) /read and write 3. Secondary(8-10/12) 4. Tech./voc. Certificate 5. Diploma 6. Degree or higher	
4	What is the educational level your partner/husband?	1. Illiterate 2. Elementary(1-6) /read and write 3. Secondary(8-10/12) 4. Tech./voc. Certificate 5. Diploma 6. Degree or higher	
5	What is your religion?	1. Orthodox 2. Catholic 3. Protestant 4. Muslim Other	
6	What is your ethnicity? SELECT THE MAJOR ETHNIC GROUP.	1. Amhara 2. Tigre 3. Agew Others (specify)	

7	What is your occupation, that is, what kind of work do you mainly do?	1. Farmer 2. Merchant 3. Government employee Others (specify)_____	
8	What is your partner/husband occupation?	1. Farmer 2. Merchant 3. Government employee Others (specify)_____	
9	What is your marital status currently?	1. Single 2. Married 3. Widowed 4. Divorced 5. Separated Others (specify)-----	
10	How many family members are there in your house hold?	Family members in number	
11	How many of your pregnancies resulted in a baby that was born alive? PROBE & ADD: Any baby who cried or showed signs of life but did not survive?	Total pregnancies..... Total babies born alive	
12	How many of your pregnancies resulted in a baby that was born dead?	Total babies born dead.....	
13	Any pregnancy loss as abortion	Total abortion.....	
14	Did the current pregnancy, wanted, mistimed or unwanted?	1. Wanted 2. Wanted but mistimed 3. Unwanted	15 - 15
15	How much longer would you have liked to wait?	Months..... Year..... 99. Don't know	
16	Did you use modern contraceptives to prevent this birth?	0 No 1 Yes	- 16
17	Which type of contraceptive you were using?	1. Pills 2. Injectables 3. IUCD 4. Condom Others (specify)-----	
Calculate the gestational age and arrange appointment in the 9 th month of pregnancy Say: Thank you!			

The first evaluation

	District	Kebele	HH head	Women	Data collector
Name					
ID (code)					
Gestational date in weeks_____					
Date of data collection_____			Time: from_____to_____		

Assessment of essential services received by pregnant women (101-122)					
The following questions /check lists are prepared to record whether the women receives important services during pregnancy from different providers					
Q.	Question and filters	Response code	SKIP		
101	Did you have any antenatal care for the current pregnancy?	0 No 1 Yes	- 1 03		
102	Why you are not using antenatal care? Probe and record all reasons mentioned	Reasons:	123		
103	How many times in total did you receive antenatal care during this pregnancy?	Number of times..... 99. Don't know			
104	Where did you receive antenatal care for this pregnancy?	1. Home 2. Gvt. Hospital 3. Gvt. Health center 4. Gvt. Health post 5. Private clinic 6. TBA home Other_____			
105	Whom did you see on your antenatal visit? <i>If women mention different level of providers at different visits, record the higher level provider</i>	1. Doctor 2. Health officer 3. Nurse/midwife 4. Health extension workers 5. TBA Other(specify)_____ 99. Don't know			
Put a thick mark X if women have received services (information sources: response of pregnant and observation of chart and drugs)					
		No(0)	Yes(1)	DN(99)	
106	Blood pressure measured				
107	Weight measured				
108	Screened for HIV				
109	Screened for Syphilis				
110	Urine sample checked				
111	TT (tetanus) immunization received				
112	Drugs to prevent malaria taken				
113	Drugs to prevent anemia taken				
114	Diet and nutrition during pregnancy advised				
115	Have information on baby growth				
116	Preparation for clean delivery discussed				
117	Place of birth discussed				
118	Have information on danger signs during pregnancy				
119	Have information on danger signs during delivery				
120	Have information on danger signs after delivery				
121	Readiness for complication discussed				
122	Overall, are you satisfied by the service you received?				
Assessment of behavior change (123-127)					

123	Can you name any danger signs during pregnancy, childbirth, or soon after delivery that indicate a woman has a serious health problem? <i>Probe and record all mentioned</i>	Mentioned danger signs 1. 2. 3.	
Put a thick mark <u>X</u> if women and family have reached a decision for the following issues			
		No(0)	Yes(1)
124	Place of delivery (facility) decided If decided mention the name _____		
125	Type of transport to facility decided		
126	Potential blood donor identified		
127	Money for delivery saved		
Assessment of maternal morbidity (128-130)			
If there is any morbidity, discuss with the mother for necessary managements			
128	Do you have morbidity now? Record any morbidity-----	0 No 1 Yes	
129	Have you faced complications (sever morbidity throughout the course of this pregnancy?)	0. No 1. Yes	- 130
130	What kind of complication you encountered? Check and record	1. Hypertension 2. Convulsion/fits 3. Vaginal bleeding 4. severe anemia 5. Swelling of hands or face 6. Fetal loss Others (specify)-----	
Calculate end of delivery date and arrange appointment within 1 week after delivery Say: Thank you!			

The second evaluation

	District	Kebele	HH head	Women	Data collector
Name					
ID (code)					
Age of baby in days _____					
Date of data collection _____			Time: from _____ to _____		
Assessment of provision of essential services during childbirth (201-219)					
The following questions/check lists are prepared to record whether the women receives important services during childbirth from different providers					

Q.	Question and filters	Response code	SKIP		
201	Who assisted you at the time of your delivery? Type of delivery assistant <i>If women mention different level of providers at different visits, record the higher level provider</i>	1. Doctor 2. Health officer 3. Nurse/midwife 4. TBA 5. Health extension worker 6. Relative/friend Others (specify) _____ 99. Don't know			
202	Where did you deliver your baby (name)? Type of birth place	1. Home 2. Gvt. Hospital 3. Gvt. Health center 4. Gvt. Health post 5. Private clinic 6. TBA home Other _____			
Put a thick mark <u>X</u> if women have received services (information sources: response of women and observation of chart and drugs)					
		No(0)	Yes(1)	DN(99)	
203	Blood pressure measured				
204	Informed about progress of labour				
205	Informed about conditions of the fetus				
206	Partograph used				
207	Non-traumatic delivery conducted				
208	Drugs given to prevent bleeding				
209	Baby care (resuscitation and prevention of hypothermia) given				
210	Baby weight measured				
211	Vaccine for the baby given				
212	Advised on early and exclusive breast feeding				
213	Advised on infant care				
214	Advised on nutrition				
215	Advised on family planning				
216	Informed on date of check up				
217	Readiness for complication discussed				
218	Overall, are you satisfied by the service you received from your assistants?				
Assessment of behavior change (220-223)					
Put a thick mark <u>X</u> if women and family have done the following issues					
		No(0)	Yes(1)	DN(99)	
219	Showed a clear delay at home				
220	Gave birth at health facility				
221	Assisted by skilled provider				
222	Delivery costs covered by themselves				
Assessment of maternal morbidity (224-226)					
If there is any morbidity, discuss with the mother for necessary managements					
223	Do you have morbidity now? Probe and record any morbidity-----	0 No 1 Yes			

224	Does your baby have morbidity now? Probe and record any morbidity-----	0 No 1 Yes	
225	Have you faced complications (sever morbidity during and immediately after childbirth?)	0 No 1 Yes	- 226
226	What kind of complication you encountered? Check and record	1. Hypertension 2. Convulsion/fits 3. Prolonged labour 4. Vaginal bleeding 5. Fetal death 6. Fever (sepsis) 7. Leakage of urine or stool (fistula) Others (specify)-----	
Arrange appointment when the women complete 6 weeks after delivery Say: Thank you!			
If there is maternal death due to complication, discuss the cause with husband /family and record. Further follow up will be interrupted b/c of maternal death			

The third evaluation

	District	Kebele	HH head	Women	Data collector
Name					
ID (code)					
Age of baby in days _____					
Date of data collection _____ Time: from _____ to _____					
Assessment of essential services during the post partum period (301-314) The following questions/check lists are prepared to record whether the women receives important services during the post partum period from different providers					
Q.	Question and filters			Response code	SKIP
301	Did you have any postnatal checkup in these 6 weeks?			0 No 1 Yes	- 303
302	Why you are not using postnatal care? Probe and record all reasons mentioned			Reasons:	315
303	Where did you receive postnatal care?			1. Home 2. Gvt. Hospital 3. Gvt. Health center 4. Gvt. Health post 5. Private clinic 6. TBA home 7. Other _____	
304	Whom did you see on your postnatal visit? <i>If women mention different level of providers at different visits, record the higher level provider</i>			1. Doctor 2. Health officer 3. Nurse/midwife 4. Health extension workers 5. TBA Other(specify) _____ 99. Don't know	

Put a thick mark <u>X</u> if women have received services (information sources: response of women and observation of chart and drugs)					
		No(0)	Yes(1)	DN(99)	
305	Blood pressure measured				
306	Vaginal discharge checked				
307	Bleeding checked				
308	Breast problems checked				
309	Drugs (Fefol) to prevent anemia given				
310	Family planning advised				
311	Exclusive breastfeeding advised				
312	Infant care advised				
313	Infant immunization advised				
314	Overall, are you satisfied by the service you received?				
Assessment of behavior change (315-318)					
Put a thick mark <u>X</u> if women and family have done the following issues					
		No(0)	Yes(1)	DN(99)	
315	Have a checkup in health facilities				
316	Family planning methods started				
317	Practicing exclusive breast feeding				
318	Infant immunization started				
Assessment of maternal and neonatal morbidity (319-321)					
If there is any morbidity, discuss with the mother for necessary managements					
319	Do you have morbidity now? Probe and record any morbidity-----	0 No 1 Yes			
320	Does your baby have morbidity now? Probe and record any morbidity-----	0 No 1 Yes			
321	Have you faced complications (sever morbidity) during the postnatal period?	0 No 1 Yes			- 322
322	What kind of complication you encountered? Check and record	1. Convulsion/fits 2. Vaginal bleeding 3. Fever (sepsis) 4. Leakage of urine or stool (fistula) 5. Neonatal death Others (specify)-----			
Give a health education session for the mother and family This is the end of the follow-up Say: Thank you!					

AMHARIC VERSION

የእናቶችቃለ መጠይቅ

ማስታወሻ: ቤት ሲደርሱ ባለፈው አንድ አመት ውስጥ ወሊድ መኖሩን ያረጋግጡ :: ወሊድ ካለ የሚመለከታቸውን እናት በማገኘት ጥያቄውን ይቀጥሉ :: ከሌለ አመስግንው በማሰናበት ወደሚቀጥለው ቤት ይሂዱ ::

መረጃ መስጫ ቅጽ

ቃለ መጠይቅ ለሚደረግላት እናት (ቤተሰብ) ቅጹን ያንብቡ::

ጥናቱ የሚካሄድበት ዓላማ ፤ ይህ ጥናት በሰሜን ጎንደር የሚካሄደው የእናቶች በሰለጠነ የጤና ባለሙያ የጤና አገልግሎት አጠቃቀም አሰሳ አንዱ ክፍል ነው:: የዚህ ክፍል ዓላማ እናቶች በቅድመ ወሊድ፣ በወሊድና ድህረ ወሊድ ወቅት በሰለጠነ ባለሙያ ስለሚሰጥ አገልግሎት ያላቸውን ግንዛቤ፣ አመለካከትና ትግበራ ለማሰስ ነው::

አተገባበር ፤ ይህንን ጥናት ለመተግበር መጀመሪያ የእርስዎን ፈቃደኝነት እናረጋግጣለን:: ፈቃደኛ ከሆኑ የስምምነት ቅጹ ላይ ይፈርመሩልናል:: በቅድሚያ በቤት ውስጥ ስላሉት ሰዎች ንበረት አንዳድ ጥያቄዎች እጠይቃለሁ በመቀጠል በእርግዝናና ወሊድ ዙሪያ እንጠይቃለን::

ተጓዳኝ ጉዳዮች፤ በዚህ ጥናት በመሳተፊዎ በሚያባክኑት ሰዓት ምክንያት ምቹት ላይሰማዎት ይችላል:: በተረፈ ግን በጥናቱ መሳተፍ ምንም ዓይነት ጉዳት አያስከትልም:: ስለዚህ የሚሰጡት መረጃ ለእናቶችህ ጤና አገልግሎት መሻሻል ጠቃሚ ግብዓት ይሆናል::

ጥቅሞች፤ እርስዎ በዚህ ጥናት ተሳታፊ በመሆንዎ በቀጥታ ወይም በሌላ መንገድ የውጤቱ ተጠቃሚ ነዎት:: ወደፊትም የርሶ ቤተሰብ እና ማህበረሰብ ተጠቃሚ የሚሆኑበት ጥናት ነው::

ሌሎች ጥቅማጥቅሞች፤ በዚህ ጥናት ተሳታፊ በመሆኖዎ ምንም ዓይነት ማበረታቻ ወይም ክፍያ አይሰጠዎትም::

ምስጢራዊነት፤ ለዚህ የጥናት ፕሮጀክት የሚሰበሰበው መረጃ የግል ጉዳዮችህን ያካተተ በመሆኑ ማን ምን መልስ እንደሰጡ/ች ምስጢር እንዲሆን ጥንቃቄ ይደርግበታል:: ከተመራማሪው ውጭ ለማንም አይሰጥም፤ በቁልፍ ተቆልፎ እንድቀመጥም ይደረጋል::

ከጥናቱ ያለመሳተፍ ወይም የማቋረጥ መብት፤ በዚህ ጥናት ያለመሳተፍ መብትዎ ሙሉ በሙሉ የተጠበቀ ነው:: ለጥያቄዎቹ በሙሉም ሆነ በከፊል መልስ አለመስጠት ይችላሉ:: እንደሁም በማንኛውም ሰዓት ማንኛውንም መብትዎን ሳያጡ የማቋረጥ ሙሉ መብት አለዎት::

ማግኘት የሚችሏቸው ሰዎች፤

የበለጠ መረጃ ማግኘት የሚፈልጉ ከሆኑ፤

አቶ አበበው ገበየሁን በስልክ ቁጥር 251_920314519 ወይም

በአድራሻ አበበ ዩኒቨርሲቲ ይህን ጥናት ያፀደቀውን የስነ ምግባር ኮሚቴ በስልክ ቁጥር 251_115538734,

e-mail: aaumfirb@yahoo.com ማግኘት ይችላሉ::

የጥናት ተሳትፎ ፍቃድ መጠየቂያ ቅጽ

ከላይ የተሰጡትን መረጃዎች በማገናዘብና በመረዳት በጥናቱ ለመሳተፍ ፋቃደኛ ኖት?

አዎን

የተሳታፊ ፊርማ/የጣት አሻራ ፊርማ/የጣት አሻራ _____ ቀን _____ (ወደ ቃለ-መጠይቁ ይለፉ)

የለም _____ (ቃለ-መጠይቁን ያቁሙ)

የመረጃ ሰብሳቢዉ ፊርማ ስም _____ ፊርማ _____ ቀን _____ ሰዓት _____

የተቆጣጣሪዉ ፊርማ ስም _____ ፊርማ _____ ቀን _____
--

	ወረዳ	ቀበሌ	የቤቱ ባለቤት	ቃለ መጠይቅ የሚደረግላት እናት	መረጃ ሰብሳቢ ባለሙያ
ስም					
መለያ (ኮድ)					
መረጃው የተሰበሰበበት ቀን:-			መረጃው የተሰበሰበበት ሰዓት:-		

ክፍል አንድ
የቤት ንብረትና አባላትን በሚመለከት

ተ.ቁ	መጠይቅ	አማራጮች	ቀጣይ ጥያቄ
101	በቤቱ ውስጥ ምን ያህል የቤተሰብ አባላት አሉ?	የቤተሰብ ብዛት	
102	ቤተሰቡ ውሃ የሚያገኘው ከየት ነው?	1. የቧንቧ ውሃ 2. ያልተጠበቀ ጉድጓድ ውሃ 3. የተጠበቀ ጉድጓድ ውሃ 4. የምነጭ ውሃ 5. የወንዝ ውሃ ሌላ _____	
103	ውሃው ያለበት ቦታ የት ነው?	1. በቤት ውስጥ 2. በግቢ ውስጥ 3. ውጭ	
104	ውሃ ቀድሞ ለመመለስ ምን ያህል ጊዜ ይወስዳል? በደቂቃ ይመዝግቡ	ደቂቃ..... 99. አላውቅም	
105	የቤተሰቡ አባላት በአብዛሃኛው መፀዳጃ የሚጠቀሙ የት ነው?	1. ሜዳ 2. በውሃ የሚሰራ መፀዳጃ 3. የተለምዶ ጉድጓድ መፀዳጃ 4. ሽታ አልባ መፀዳጃ ሌላ(ይገለፅ) _____	
106	መፀዳጃ ቤቱን ጎረቤት ይጠቀምበታል?	0. የለም 1. አዎ	
107	በቤት ውስጥ ከሚከተሉት ምን ምን አሉ?	የለም(0)	አዎ (1)
	('X' ምልክት ያድርጉ)	ኤሌክትሪክ መብራት	
		ሬድዮ	
		ቴሌቪዥን	
		የቤት ስልክ	
		ሞባይል ስልክ	
		ፍሪጅ	
108	ቤት ውስጥ በአብዛሃኛው ለማብሰል የምትጠቀሙት በምንድን ነው?	1. ኤሌክትሪክ 2. ኬሮሲን 3. የእንጨት ከሰል 4. የማገዶ እንጨት 5. ኩባት ሌላ _____	
109	የቤቱ ወለል የተሰራበት ያዩትን ይመዝግቡ	4. አፈር/አሸዋ 5. በበት የተለቀለቀ 6. በሲሚንት የተለሰነ ሌላ _____	
110	የቤቱ ጣራ የተሰራበት ያዩትን ይመዝግቡ	1. ሳር ክዳን 2. ቆርቆሮ 3. ኮንክሪት ሌላ _____	
111	ቤተሰቡ ለርሻ የሚሆን መሬት አለው?	2. የለም 3. አዎ	115
112	ለርሻ የሚሆነው ቤተሰብ መሬት ስፋት ምን ያህል ካሬ ይሆናል?	ካሬ ሜትር	
113	ከሚከተሉት እንስሳት ውስጥ በቤት ውስጥ ምን ያህል አሉ?	የእንስሳት ዓይነት	ቁጥር
		ላምና በሬ	
		ፈረስ፤ አህያና በቅሎ	
		በግና ፍየልች	
		ዶሮዎች	

114	ከቤተሰቡ ውስጥ የባንክ አካላት ያለው አለ?	0. የለም 1. አዎ	
-----	-----------------------------	-----------------	--

ግላዊ መረጃዎችን በሚመለከት

115	በዚህ ቀበሌ ምን ያህል ጊዜ ቆዩ?	ዓመት ሁልጊዜ	
116	የተወለዱበት ዓመትና ወር መቶ ነው?	ወር ዓመት 99. አላውቀውም	
117	የትምህርት ደረጃዎ አስከምን ድረስ ነው?	1. አልተማርኩም 2. አንደኛ ደረጃ (1-6) /ማንበብና መጻፍ/ 3. ሁለተኛ ደረጃ (8-10/12) 4. በቴክኒክ ትምህርት ሰርቴፊኬት 5. ዲፕሎማ 6. ዲግሪና ከዚያ በላይ	
118	የባለቤት/ዳኛዎ የትምህርት ደረጃ?	1. አልተማረም 2. አንደኛ ደረጃ (1-6) /ማንበብና መጻፍ/ 3. ሁለተኛ ደረጃ (8-10/12) 4. በቴክኒክ ትምህርት ሰርቴፊኬት 5. ዲፕሎማ 6. ዲግሪና ከዚያ በላይ	
119	ምን ያህል ጊዜ ፊደሉ ያዳምጣሉ?	1. ምንም 2. በሳምንት ቢያንስ አንድ ጊዜ 3. በየቀኑ	
120	ምን ያህል ጊዜ ቴሌቪዥን ያያሉ?	1. ምንም 2. በሳምንት ቢያንስ አንድ ጊዜ 3. በየቀኑ	
121	ሃይማኖትዎ ምንድን ነው?	1. ኦርቶዶክስ 2. ካቶሊክ 3. ፕሮቴስታንት 4. ሙስሊም ሌላ (ይጠቀስ)	
122	ብሄርዎ ምንድን ነው? አባክዎ ዋናውን ብሄር ይመዝግቡ	1. አማራ 2. ትግሬ 3. አገው ሌላ (ይጠቀስ)-----	
123	እርስዎ የሚሰሩት ስራ ምንድን ነው?	1. ግብርና 2. ንግድ 3. የመንግስት ስራተኛ ሌላ (ይጠቀስ)-----	
124	የባለቤትዎ ስራ ምንድን ነው?	1. ግብርና 2. ንግድ 3. የመንግስት ስራተኛ ሌላ (ይጠቀስ)-----	
125	በአሁኑ ሰዓት የጋብቻዎ ሁኔታ ምን ላይ ነው?	1. ብቸኛ ነኝ 2. አግብቻለሁ 3. ፈትቻለሁ 4. ባሌ ሞቷል ሌላ (ይጠቀስ) -----	

ክፍል 2: የእናቶች ጤና አገልግሎት ግንዛቤ

ተ.ቁ	መጠይቅ	አማራጮች		ቀጣይ ጥያቄ
201	በሰለጠነ የጤና ባለሙያ ስለሚሰጥ የጤና አገልግሎት ስምተው ያውቃሉ?	0. የለም 1. አዎ		
202	የወሊድ ዝግጅት ስለሚባለው ስምተው ያውቃሉ?	0. የለም 1. አዎ		204
203	ስለ ወሊድ ዝግጅት የሰሙት፣ያዩት ወይም ያነበቡበት ምንጭ ከምንድነው? ሁሉንም ምንጮች አረጋግጠው ይጻፉ። በዝርዝር የቀለቡትን ማንበብ አያስፈልግም።	1. የብዙሃን መገናኛ (ሬዲዮ ወይም ቴሌቪዥን) 2. ከተጻፉ መዛግብት 3. በህዝብ ስብሰባ ላይ 4. ከጓደኛ/ጎረቤት 5. ከቤተሰብ አባላት 6. ከልምድ አዋላጅ/ጤና ኤክስፔንሽን ባለሙያ 7. ከኃይማኖት መሪዎች 8. ከጤና ባለሙያ ሌላ (ይጠቀስ)		
204	እንዳንድ ሴቶች ከሌሎች በበለጠ ከእርግዝና ወይም ወሊድ ጋር ተያይዘው በሚመጡ ከባድ ችግሮች ሊጎዱ ይችላሉ ብለው ይገምታሉ?	0. የለም 1. አዎ 99. አላውቅም		
205	ቀጥሎ የተዘረዘሩትን ባህሪ ያላቸው ሴቶች ለከፋ የርግዝና ወይም ወሊድ ችግር ከሌሎች በተለየ የመጋለጥ እድል አላቸው? የሚሰጡትን መልሶች አረጋግጠው ይጻፉ።	የለም(0)	አዎ (1)	
	በእድሜያቸው የገፋ በእድሜያቸው ወጣት የሆኑ የመጀመሪያ ልጃቸውን ሲያረግዙ ከአምስት ልጅ በላይ የወለዱ ራስ በራስ የሚወልዱ ቁመታቸው አጭር የሆኑ ደሃ የሆኑ			
206	እንድት እናት ማን ቢያዋልዳት ይሻላል?	1. ጤና ባለሙያ (ዶክተር/አዋላጅ ነርስ) 2. የልምድ አዋላጅ 3. የቤተሰብ አባል 99. አላውቅም		
207	እንድት እናት በሰላም ከተገላገለች በህዋላ የጤና ባለሙያ መታየት ያስፈልጋታል በሚለው ሀሳብ ይስማማሉ?	0. አልስማማም 1. እስማማለሁ 99. አላውቅም		
208	እንድት እናት ከወለደች ሰባት ቀን ሳይሞላት ከቤት/ግቢ ወጥታ ብትንቀሳቀስ ምንም ችግር የለውም በሚለው ሀሳብ ይስማማሉ?	0. አልስማማም 1. እስማማለሁ 99. አላውቅም		
209	እንድት እናት ከወለደች ስድስት ሳምንት ሳይሞላት ከቤት/ግቢ ወጥታ ብትንቀሳቀስ ምንም ችግር የለውም በሚለው ሀሳብ ይስማማሉ? ከቤት እንዳትወጣለሁት ከሰላም ምን ያህል ጊዜ እንደሆነ ይጠይቁ	0. አልስማማም 1. እስማማለሁ 99. አላውቅም መቆየት ያለባት ጊዜ-----		
210	እንድት እናት የት እንደምትወለድ አስቀድሞ ማቀድ አለባት በሚለው ሀሳብ ይስማማሉ?	0. አልስማማም 1. እስማማለሁ 99. አላውቅም		
211	እንድት እናት ከወሊድ ጋር ተያይዘው ለሚከሰቱ ድንገተኛ አደጋዎች አስቀድሞ ማቀድ አለባት በሚለው ሀሳብ ይስማማሉ?	0. አልስማማም 1. እስማማለሁ 99. አላውቅም		
212	እንድት እናትና ቤተሰቧ በርግዝና ወቅት ከወሊድ ጋር ተያይዘው ለሚከሰቱ ድንገተኛ አደጋዎች ቀጥሎ የተጠቀሱትን ዝግጅቶች መኖር አለባቸው ይላሉ?	የለም(0)	አዎ (1)	

	• የት እንደምትወለድ መወሰን • ገንዘብ ማዘጋጀት • መጓጓዣ ማቀድ • ደም የሚለግስ ማዘጋጀት			
213	ከወሊድ ጋር ተያይዘው ለሚከሰቱ ድንገተኛ አደጋዎች የሚሆኑ ምልክቶችን መጥቀስ ይችላሉ? ከቻሉ ምን ምን ናቸው? እባክዎ የተጠቀሱትን ሁሉ ይመዝግቡ	1. ከፍተኛ ደም መፍሰስ 2. የህጻኑ አመጣጥ መዛባት 3. የእግርና እጅ ማበጥ 4. ማንቀጥቀጥ 5. ትኩሳት 6. የምጥ መራዘም 7. እነግደ ልጅ መቅረት 8. ሽታ ያለው ፈሳሽ 9. ደም ማነስ 10. ሽንት አለመቆጣጠር 11. ሰገራ አለመቆጣጠር ሌሎች (ዘርዘር) _____ 99. አላውቅም		
214	አንድት እናት በዶክተር/ አዋላጅ ነርስ ለመገልገል የት መሄድ እንዳለባት የውቃሉ? ካወቁ የት?	1. የመንግስት ሆስፒታል 2. የመንግስት ጤና ጣቢያ 3. የመንግስት ክሊኒክ 4. የግል ክሊኒክ ሌሎች (ዘርዘር) _____ 99. አላውቅም		

ክፍል 3:
እርግዝናና የህፃናት ውልደት

ተ.ቁ	መጠይቅ	አማራጮች	ቀጣይ ጥያቄ
301	ከጠቅላላ እርግዝናዎ ውስጥ በህይወት የተወለዱት ህፃናት ስንት ናቸው? እባክዎ በህይወት ተወልደው ወዳውኑ የሞቱትን ካርጋገጡ በኋላ ጨምረው ይመዝግቡ	ጠቅላላ በህይወት የተወለዱ ብዛት.....	
302	ሞቶ የተወለደ ህፃን አጋጥሞዎት ያውቃል?	0. የለም 2. አጋጥሞኛል	
303	ከጠቅላላ እርግዝናዎ ውስጥ ሞተው (ጠፍተው) የተወለዱት ህፃናት ስንት ናቸው?	ጠቅላላ ሞተው የተወለዱ ብዛት.....	

ክፍል 4
የእርግዝና ውሊድና ድህረ ወሊድ ጤና አገልግሎት ትግበራ

የህፃኑን ስም በመጥራት ይጠቀሙ :: ስም ካልወጣለት ደግሞ ህፃን በማለት ይጠቀሙ :: ጥቂዎችን በመጨረሻ ለተወለደው ህፃን ብቻ ያቅርቡ :: በሚቀጥለው ዓረፍተ ነገር ይጀምሩ፤ አሁን ከወሊድ በፊት፤ በወሊድ ወቅት እና ከወሊድ በኋላ ስለነበሩ ሁኔታዎች አንዳንድ ጥያቄዎችን ልጣይቀወት እፈልጋለሁ ::			
ተ.ቁ	መጠይቅ	አማራጮች	ቀጣይ ጥያቄ
401	የመጨረሻ እርግዝናዎን የተገላገሉት መቸ ነበር?	ወር-----ዓመት-----	
402	እርግዝናውን ሲገላገሉ ስንት ሳምንት ሆኖዎት ነበር?	ሳምንት-----	
403	ህፃኑ ሲወለድ የነበረው ሁኔታ ?	1. በህወት ተወለደ 2. ሞቶ ተወለደ	
404	በህይወት ከተወለደ ስሙን ይጠይቁ	ስም _____	
405	ይህንን ህፃን (ስም) ሲያረግዙ እርግዝናውን ፈልገውት፤ ፈልገውት ነገር ግን ቆይቶ መምጣት ያለበት ወይስ ሳይፈልጉት ነበር?	1. ፈልገውት 2. ፈልገውት ነገር ግን መቆየት የነበረበት 3. ያልተፈለገ	407 407

406	ምን ያህል ጊዜ መቆየት ይፈልጉ ነበር?	ወር..... ዓመት..... 99. አላውቅም	
407	ለዚህ እርግዝና የወሊድ መከላከያ ተጠቅመው ነበር?	0. የለም 1. አዎ	409
408	ምን ዓይነት መከላከያ ተጠቀሙ ?	1. የሚዋጥ 2. በመርፌ የሚሰጥ 3. በማህፀን የሚገባ 4. ኮንዶም ሌላ (ይገልጽ) -----	
የእረግዝና ክትትል			
409	ከዚህ በፊት በነበሩት እረግዝናዎች ክትትል አድርገው ያውቃሉ?	0. የለም 1. አዎ	
410	ይህንን ህፃን (ስም) ሲያረግዙ የእረግዝና ክትትል አድርገው ነበር?	0. የለም 1. አዎ	413
411	የሚከተሉት ምክንያቶች የእረግዝና ክትትል እንዳያደርጉ አስተዋፅኦ ነበራቸው? • አስፈላጊ መስሎ ስላልታዩኝ • ባለቤቴ/ቤተሰቤ አያስፈልግም ስላሉ • ጤና ድርጅቱ ሩቅ በመሆኑ • ትራኒስፖርት ስለሌለ • ውድ ስለሆነ • አገልግሎቱ ጥራት ስለሌለው • ቤት ውስጥ አማራጭ ስላለ • አገልግሎቱ የት እንደሚሰጥ ስለማላውቅ • ጊዜ ስለሌለኝ • ገንዘብ ስለሌለኝ	የለም (0)	አዎ (1)
412	ከእርግዝና ጋር ተያይዘው የሚከሰቱ ከባድ የጤና ችግሮች ለምሳሌ የደም ግፊትና ራስ መሳት, የደም መፍሰስና ደም ማነስ አጋጥሞዎት ነበር? መኖሩን ያረጋግጡ	0. የለም 1. አዎ 100. 99. አላውቅም	454 478
113	ለምን ያህል ጊዜ ክትትል አደረጉ?	ጊዜ..... 99. አላስታውስም	
114	የእርግዝና ክትትሉን ያደረጉት የት ቦታ ነው?	1. ቤት ውስጥ 2. ከመንግስት ሆስፒታል 3. ከመንግስት ጤና ጣቢያ 4. ከመንግስት ክሊኒክ 5. ከግል ክሊኒክ ሌላ _____	
115	ለክትትል በሚሄዱበት ወቅት ምን ዓይነት መጓጓዣ ተጠቀሙ? አንዱን ብቻ ይመዝግቡ	1. መኪና 2. ሞተር ሳይክል 3. የህዝብ አውቶቡስ 4. ጋሪ 5. አንቡላንስ 6. በእግር ሌላ(ይገልጽ) _____	
416	ከቦታው ለመድረስ ስንት ደቂቃ/ኪሎ ሜትር ነው? በደቂቃና በኪሎ ሜትር ይመዝግቡ 1 ሰዓት = 60 ደቂቃ	ደቂቃ ኪሎ ሜትር..... 99. አላውቅም	
417	ጤና ድርጅት ከደረሱ በኋላ ከባለሙያው እስከሚገናኙ ምን ያህል ደቂቃ ቆዩ?	ደቂቃ..... 99. አላውቅም	
418	የመጀመሪያውን ክትትል ያደረጉት ስንት ወር ሲሞላዎት ነው?	ወር..... 99. አላውቅም/አላስታውስም	

419	የመጀመሪያውን ክትትል ሲያደርጉ ያየውት ምን ዓይነት ባለሞያ ነው?	1. ዶክተር 2. ጤና መኮንን 3. ነረስ/አዋላጅ ነርስ 4. የጤና ኤክስቴንሺን ባለሞያ ሌላ (ይጠቀስ) _____ 99. አላውቅም	
420	የመጨረሻውን ክትትል ያደረጉት ስንት ሳምንት ሲሞላውት ነው?	ሳምንት..... 99. አላውቅም/አላስታውስም	
421	የመጨረሻውን ክትትል ሲያደርጉ ያየውት ምን ዓይነት ባለሞያ ነው?	1. ዶክተር 2. ጤና መኮንን 3. ነረስ/አዋላጅ ነርስ 4. የጤና ኤክስቴንሺን ባለሞያ ሌላ (ይጠቀስ) _____ 99. አላውቅም	

አሁን ይህንን ህፃን (ስም) ሲያረግዙ የነበረውትን ሁሉንም ክትትሎች ያስታውሱ :: በነዚህ ክትትሎች ወቅት የጤና ባለሞያዎች -----
('X' ምልክት ያድርጉ)

		የለም (0)	አዎ (1)	አላስታውስም /አላውቅም/(99)
422	ስለ አጠቃላይ የጤና ሁኔታ ጠየቁዎት?			
423	የደም ግፊት እየለኩ ክትትል አደረጉ?			
424	ክብደትዎን መዘኑ?			
425	የደም ናሙና ወሰዱ?			
426	የሸንት ናሙና ወሰዱ?			
427	በትከሻ የሚሰት ክትባት ተወጉ?			
428	የወባ መከላከያ መዲሃኒት ወሰዱ?			
429	የደም ማነስ መከላከያ ከኒኖችን ወሰዱ?			
430	በእርግዝና ወቅት ስለሚደረግ አመጋገብ ምክር ሰጡዎት?			
431	መቸ እንደሚወልዱ ነገሩዎት?			
432	የህፃኑን እድገት ነገሩዎት?			
433	ስለ ወሊድ ዝግጅት ተወያዩችሁ?			
434	በወሊድ ወቅት ስለሚያስፈልጉ ቁሳቁሶች ተወያዩችሁ?			
435	የት እንደሚወልዱ ተወያዩችሁ?			
436	ጤና ድርጅት እንድወልዱ ምክር ሰጡዎት?			
437	በወሊድ ወቅት ስለሚያስፈልግ ገንዘብ ተወያዩችሁ?			
438	ሌሎች የቤተሰብ አባላት በወሊድ ዝግጅቱ ላይ እንደት እንደሚሳተፉ ተወያዩችሁ?			
439	በርግዝና ወቅት ስለሚከሰቱ አደገኛ ምልክቶች ነገሩዎት?			
440	በወሊድ ወቅት ስለሚከሰቱ አደገኛ ምልክቶች ነገሩዎት?			
441	ከወሊድ በኋላ ስለሚከሰቱ አደገኛ ምልክቶች ነገሩዎት?			
442	በርግዝና ወይም ምሊድ ጊዜ ለምሳሌ የደም መፍሰስ፣ የሰውነት ማበጥ፣ ማንቀጥቀጥና እራስ መሳት የመሳሰሉት ችግሮች በሚከሰቱበት ወቅት የት መሄድ እንዳለበዎት መከሩዎት?			
443	ድንገተኛ ችግር በሚከሰትበት ወቅት ወደጤና ድርጅት እንደት እንደሚሄዱ ተወያዩችሁ?			
444	ደም በያስፈልግ ደም ሊለግስ የሚችል ሰው እንደሚስፈልግ ተወያዩችሁ?			
445	ወባ በርግዝና ወቅት ስለሚያስከትለው አደጋ ተወያዩችሁ?			
446	ስለ ኤች አይ ቪ ኤድስ መከላከልና ምርመራ ተነጋገራችሁ?			
447	ከእናት ወይም ልጅ የሚተላለፍ ኤች አይ ቪን መከላከል ተነጋገራችሁ?			
448	ሌሎች የአባላዘር በሽታዎችን በሚመለከት ተነጋገራችሁ?			

ይህንን ህፃን (ስም) ሲያረግዙ ከባለቤትዎ/ከቤተሰብዎ ጋር -----('X' ምልክት ያድርጉ)

		የለም (0)	አዎ (1)	አላስታውስም /አላውቅም/(99)	
449	የት እንደሚወልዱ ተወያይታችሁ ወሰናችሁ?				
450	ስለ መጓጓዣ ተወያያችሁ?				
451	ደም ሊለግስ የሚችል ሰው አዘጋጃችሁ?				
452	ለወሊድ የሚሆን ገንዘብ አዘጋጃችሁ?				
453	ለእርግዝና ክትትል የተከፈለ ወጭ		የገንዘብ መጠን	አላውቅም(99)	
			መጓጓዣ (ደርሶ መልስ)		
			የላቦራቶሪ ክፍያ		
			ሌሎች		
			ድምር		
	ከርግዝና ጋር ተያይዘው የሚከሰቱ ከባድ የጤና ችግሮች ለምሳሌ የደም ግፊትና ራስ መሳት, የደም መፍሰስና ደም ማነስ አጋጥሞዎት ነበር? መኖሩን ያረጋግጡ	0. የለም 1. አዎ 99. አላውቅም			454 478
የወሊድ አገልግሎት					
454	ይህንን ህፃን (ስም) ሲወልዱ እርግዝናው የስንት ወር ነበር?	ወር----- 99. አላውቅም			
455	ህፃኑ (ስም) ሲወለድ ከብደቱ ተመዝግቦ ነበር?	0. የለም 1. አዎ 99. አላውቅም			
456	ከብደቱ ከተመዘገበ ምን ያህል ነበር? በግራም ይጻፉ	-----ግራም			
457	ህፃኑን (ስም) ምን ዓይነት ባለሞያ አዋለደዎት?	1. ዶክተር 2. ጤና መኮኑን 3. ነርስ/አዋላጅ ነርስ 4. ጤና ኤክስቴንሽን ባለሞያ 5. የልምድ አዋላጅ 6. ቤተሰብ/ጓደኛ ሌላ (ይገልጽ) ----- 99. አላውቅም/አላስታውስም			
አሁን ይህንን ህፃን (ስም) ሲወልዱ የነበረውትን ሁሉንም አገልግሎቶች ያስታውሱ :: በሚወልዱበት ወቅት ባለሞያዎች ----- (‘X’ ምልክት ያድርጉ)					
458		የለም (0)	አዎ (1)	አላስታውስም /አላውቅም/(99)	
	ስለ አጠቃላይ የጤና ሁኔታ ጠየቁዎት?				
	ደም ግፊት፣አተነፋፈስ፤ ልብ ምት፣የሰውነት ሙቀት አየለኩ ተከታተሉዎት?				
	የማህፀን ምርመራ እያደረጉ ተከታተሉዎት?				
	ውጫዊ የሆድ ምርመራ አደረጉ?				
	የህፃኑን እንቅስቃሴ አዳመጡ?				
	ደም እንዳይፈስ መከላከያ ሰጡዎት?				
	የምጥ መከታተያ ካርድ ተጠቀሙ?				
	ስለሚወልዱበት ሰዓትና ስለ ህፃኑ ሁኔታ መረጃ ሰጡዎት?				
	ምቹት እንድኖርዎትና አንዳይደክሙ ጥረት አደረጉ?				
	ለህፃኑ አስፈላጊውን ሁሉ አደረጉ (ሙቀት፣አስትንፋስ ወዘተ)?				
	የህፃኑ ክብደት ለኩ?				
	ለህፃኑ ክትባት ሰጡ?				
	ስለ ጡት ማጥባት ምክር ሰጡ?				
	ስለ ህፃኑ እንክብካቤ ምክር ሰጡ?				
	ስለ አመጋገብ ምክር ሰጡ?				
	ስለ ቤተሰብ ምጣኔ ምክር ሰጡ?				
	ጤና ድርጅት መቸ አንደሚሄዱ ነገሩዎት?				

459	ህፃኑን (ስም) የት ወለዱት? በመንገድ ላይ ከተወለደ ቤት እንደተወለደ ይቆጠር		1. ጤና ድርጅት ውስጥ 2. ቤት ውስጥ		462
460	ቤት ውስጥ ለመውለድ የሚከተሉት ምክንያቶች አስተዋፅኦ አድርገው ነበር? • አስፈላጊ መስሎ ስላልታየኝ • ባለቤቴ/ቤተሰቤ አያስፈልግም ስላሉ • ጤና ድርጅቱ ሩቅ በመሆኑ • ትራኒስፖርት ስለሌለ • ውድ ስለሆነ • አገልግሎቱ ጥራት ስለሌለው • ቤት ውስጥ አማራጭ ስላለ • አገልግሎቱ የት እንደሚሰጥ ስለማላውቅ • ጊዜ ስለሌለኝ • ገንዘብ ስለሌለኝ		የለም (0)	አዎ (1)	
461	ለቤት ውስጥ ወሊድ የተከፈለ ገንዘብ		የገንዘብ መጠን	አላውቅም(99)	
ለተለያዩ ቁሳቁሶች (ጓንት፣ የፅዳት ጨርቅ ወዘተ)					
ሌሎች					
ድምር					
ወደ ጥያቄ.468 ይሄዱ					
በጤና ድርጅት የወለዱ					
462	ወዴ ጤና ድርጅት ሲሄዱ ማን አብሮዎት ነበር? አብረው የመጡትን ካረጋገጡ በኋላ ሁሉንም ይመዝግቡ		1. ብቻየን 2. ባለቤቴ 3. እናቴ/አባቴ 4. ሌሎች የቤተሰብ አባላት 5. ጎረቤት/ጓደኛ 6. የጤና ባለሙያ ሌላ (ይጠቀስ) _____		
463	ወዴ ጤና ድርጅቱ ለመሄድ ምን ዓይነት መጓጓዣ ተጠቀሙ? አንድ መልስ ብቻ ይጠቀሙ		1. መኪና 2. ሞተር ሳይክል 3. የህዝብ አውቶቡስ 4. ጋሪ 5. አንቡላንስ 6. በእግር ሌላ(ይገለጽ) _____ 99. አላውቅም		
464	ከቦታው ለመድረስ ስንት ደቂቃ/ኪሎ ሜትር ነው? በደቂቃና በኪሎ ሜትር ይመዝግቡ 1 ሰዓት = 60 ደቂቃ		ደቂቃ ኪሎ ሜትር..... 99. አላውቅም		
465	ጤና ድርጅት ከደረሱ በኋላ ከባለሙያው እስከሚገናኙ ምን ያህል ደቂቃ ቆዩ?		ደቂቃ..... 99. አላውቅም		
466	በጤና ድርጅት ለሚካሄድ ወሊድ አገልግሎት የተከፈለ ገንዘብ		የገንዘብ መጠን	አላውቅም(99)	
የመጓጓዣ ወጭ					
ለተለያዩ ቁሳቁሶች (ጓንት፣ የፅዳት ጨርቅ ወዘተ)					
የአገልግሎት ክፍያ					
የላቦራቶሪ ክፍያ					
የአልጋ ክፍያ					
ሌሎች					
	ድምር				

467	ጠቅላላ የክፍሉትን ክፍያ እንደት ያዩታል፤ ውድ፣ አግባብ ያለው ወይስ ርካሽ?	1. ውድ (ከአቅም በላይ) 2. አግባብ ያለው 3. ርካሽ		
468	ከወሊድ ጋር ተያይዘው የሚከሰቱ ከባድ የጤና ችግሮች ለምሳሌ ለረጅም ጊዜ ማማጥ፤ ማንቀጥቀጥና ራስ መሳት፤ የደም መፍሰስና ህፃን በማህፀን ሳለ መሞት? መኖሩን ያረጋግጡ	0. የለም 1. አዎ	478	
ድህረ ወሊድ ጤና አገልግሎት				
469	ህፃኑን (ስም) ከወለዱ በስድስት ሳምንት ጊዜ ውስጥ የድህረ ወሊድ ምርመራ አድርገዋል?	0. የለም 1. አዎ 99. አላውቅም	471	
470	የሚከተሉት ምክንያቶች የድህረ ወሊድ ምርመራ እንዳያደርጉ አስተዋፅኦ አድርገው ነበር? • አስፈላጊ መስሎ ስላልታየኝ • ባለቤቴ/ቤተሰቤ አያስፈልግም ስላሉ • ጤና ድርጅቱ ሩቅ በመሆኑ • ትራኒስፖርት ስለሌለ • ውድ ስለሆነ • አገልግሎቱ ጥራት ስለሌለው • ቤት ውስጥ አማራጭ ስላለ • አገልግሎቱ የት እንደሚሰጥ ስለማላውቅ • ጊዜ ስለሌለኝ • ገንዘብ ስለሌለኝ	የለም (0)	አዎ (1)	
ወደ ጥያቄ 477 ይሂዱ				
471	ከወለዱ ከስንት ቀን በኋላ የመጀመሪያውን ድህረ ወሊድ ምርመራ ፈፀሙ? የወለዱበት ቀን ብቻ ከሆነ '0' ብለው ይመዝግቡ	ቀናት ከወሊድ በኋላ..... 99. አላውቅም		
472	የመጀመሪያውን ድህረ ወሊድ ምርመራ ያደረገለዎት ምን ዓይነት ባለሞያ ነው?	1. ዶክተር 2. ጤና መኮነን 3. ነርስ/አዋላጅ ነርስ 4. ጤና ኤክስቴንሽን ባለሞያ 5. የልምድ አዋላጅ 6. ቤተሰብ/ጓደኛ ሌላ (ይገልጽ) ----- 99. አላውቅም/አላስታውስም		
473	ይህ የመጀመሪያው ድህረ ወሊድ ምርመራ የተካሄደው የት ቦታ ነው?	1. ቤት ውስጥ 2. ከመንግስት ሆስፒታል 3. ከመንግስት ጤና ጣቢያ 4. ከመንግስት ክሊኒክ 5. ከግል ክሊኒክ ሌላ _____		
474	የመጀመሪያውን ድህረ ወሊድ ምርመራ ለማድረግ በሚሄዱበት ወቅት ምን ዓይነት መጓጓዣ ተጠቀሙ? አንዱን ብቻ ይመዝግቡ	1. መኪና 2. ሞተር ሳይክል 3. የህዝብ አውቶቡስ 4. ጋሪ 5. አንቡላንስ 6. በእግር ሌላ(ይገልጽ) _____		
አሁን ህፃን (ስም) ከወለዱ በኋላ በድህረ ወሊድ ምርመራ የተሰጠውትን ሁሉንም አገልግሎቶች ያስታውሱ :: በድህረ ወሊድ ምርመራ ወቅት ባለሞያዎች ----- ('X' ምልክት ያድርጉ)				
		የለም(0)	አዎ(1)	አላስታውስም /አላውቅም/(99)
	ስለ አጠቃላይ የጤና ሁኔታ ጠየቁዎት?			

475	ውጫዊ የሆድ ምርመራ አደረጉ?				
	የጡት ምርመራ አደረጉ?				
	የማህፀን ምርመራ አደረጉ?				
	ስለ ማህፀን ፈሳሽ ጠየቁዎት?				
	ስለ ደም መፍሰስ ጠየቁዎት?				
	ስለ ቤተሰብ ምጣኔ ተወያዩችሁ?				
	የርግዝና መከላከያ ሰጡዎት?				
	ስለ ጡት ማጥባት ምክር ሰጡዎት?				
	ስለ ህፃናት እንክብካቤ ምክር ሰጡዎት?				
	ለህፃኑ ከትባት ሰጡ?				
476	ለድህረ ወሊድ ጤና አግልግሎት የተከፈለ ገንዘብ		የገንዘብ መጠን		አላውቅም(99)
		መጓጓዣ ወጭ			
		ለተለያዩ ቁሳቁሶች (ጓንት፣ የርግዝና መከላከያ ወዘተ)			
		የአገልግሎት ክፍያ			
		የላቦራቶሪ ክፍያ			
		ሌሎች			
		ድምር			
477	ከወሊድ በኋላ የሚከሰቱ ከባድ የጤና ችግሮች ለምሳሌ ትኩሳት (ኢንፌክሽን)፤ ማንቀጥቀጥና ራስ መሳት፤ፊስቱላ፤ የደም መፍሰስ አጋጥሞዎታል? መኖሩን ያረጋግጡ		2. የለም 3. አዎ		478
ከርግዝናና ወሊድ ጋር ተይይዘው ለሚከሰቱ ከፍተኛ ችግሮች የሚሰጥ የጤና አግልግሎት					
478	ምን አይነት የጤና ችግር ገጠመዎት?		1. የደም መፍሰስ 2. የሰውነት ማበጥ 3. ማንቀጥቀጥና ራስ መሳት 4. ለረጅም ጊዜ ማማጥ 5. ህፃን በማህፀን ሳለ መሞት 6. ትኩሳት (ኢንፌክሽን) 7. ፊስቱላ ሌላ (ይጠቀስ)-----		
479	ለችግሩ መፍትሄ አፈላለጉ?		2. የለም 3. አዎ		481
480	የሚከተሉት ምክንያቶች መፍትሄ እንዳያፈላልጉ አስተዋፅኦ አድርገው ነበር?		የለም (0)	አዎ (1)	
	• አስፈላጊ መስሎ ስላልታየኝ (የሚከብድ ስላልመሰለኝ) • ባለቤቴ/ቤተሰቤ አያስፈልግም ስላሉ • ጤና ድርጅቱ ሩቅ በመሆኑ • ትራንስፖርት ስለሌለ • ውድ ስለሆነ • አገልግሎቱ ጥራት ስለሌለው • ቤት ውስጥ አማራጭ ስላለ • አገልግሎቱ የት እንደሚሰጥ ስለማላውቅ • ጊዜ ስለሌለኝ • ገንዘብ ስለሌለኝ				
481	ችግሩን ያየለወት ምን ዓይነት ባለሞያ ነው?		1. ዶክተር 2. ጤና መኮነን 3. ነርስ/አዋላጅ ነርስ 4. ጤና ኤክስቴንሽን ባለሞያ 5. የልምድ አዋላጅ 6. ቤተሰብ/ጓደኛ ሌላ (ይገልጽ) ----- 99. አላውቅም/አላስታውስም		

482	ለችግሩ መፍተሄ ለማፈለግ ወደ አንድ ቦታ መሄድ አለመሄድ ወሳኝ ማን ነው? አንድ መልስ ብቻ ይምረጡ	1. ውሳኔ አልነበረም 2. እኔ እራሴ 3. እናቴ/አባቴ 4. ሌሎች የቤተሰብ አባላት 5. ጎረቤት/ጓደኛ 6. የጤና ባለሞያ ሌላ (ይጠቀስ) _____			
482	ለችግሩ ወደ ጤና ድርጅት ሄደው ነበር? ከሄዱ ምን ዓይነት?	1. ከመንግስት ሆስፒታል 2. ከመንግስት ጤና ጣቢያ 3. ከመንግስት ክሊኒክ 4. ከግል ክሊኒክ ሌላ (ይጠቀስ) _____			
483	ወዴ ጤና ድርጅት ሲሄዱ አብሮዎት ሰው ነበር? አብሮ የነበረ ካለ ይመዝግቡ	0. የለም 1. አዎ አብሮ የነበረ _____			
484	ወዴ ጤና ድርጅቱ ለመሄድ ምን ዓይነት መጓጓዣ ተጠቀሙ? አንድ መልስ ብቻ ይጠቀሙ	1. መኪና 2. ሞተር ሳይክል 3. የህዝብ አውቶቡስ 4. ጋሪ 5. አንቡላንስ 6. በእግር ሌላ(ይገለጽ) _____			
485	ከቦታው ለመድረስ ስንት ደቂቃ/ኪሎ ሜትር ነው? በደቂቃና በኪሎ ሜትር ይመዝግቡ 1 ሰዓት = 60 ደቂቃ	ደቂቃ ኪሎ ሜትር..... 99. አላውቅም			
486	ጤና ድርጅት ከደረሱ በኋላ ከባለሞያው እስከሚገናኙ ምን ያህል ደቂቃ ቆዩ?	ደቂቃ..... 99. አላውቅም			
487	በጤና ድርጅቱ ለዚህ ችግር የተሰጠዎት ዋናው የጤና አገልግሎት ምን ነበር? አረጋግጠው የፃፉ?	_____			
488	ለጤና አግልገሎቱ የተከፈለ ገንዘብ		የገንዘብ መጠን	አላውቅም(99)	
		መጓጓዣ ወጪ			
		ለተለያዩ ቁሳቁሶች (ጓንት፣ የፅዳት ጨርቅ ወዘተ)			
		የአገልግሎት ክፍያ			
		የላቦራቶሪ ክፍያ			
		የአልጋ ክፍያ			
		ሌሎች			
		ድምር			

ለሰጡኝ ጠቃሚ መረጃ በጣም አመሰግናለሁ!

የአካባቢ መረጃ ለማወቅ የተዘጋጀ ቃለ መጠይቅ

በአካባቢው ያለውን ጠቃሚ መረጃ ለማግኘት የቀበሌ አስተዳዳሪዎች ወይም ሌሎች ኃላፊነት ያላቸው ሰዎች ቃለ መጠይቅ ይደረግላቸዋል፡፡

መረጃ መስጫ ቅጽ

ቃለ መጠይቅ ለሚደረግለት ሰው ቅጹን ያንብቡላቸው፡፡

የጥናት ፕሮጀክቱ የሚካሄድበት ዓላማ ፤ ይህ ጥናት በሰሜን ጎንደር የሚካሄደው የእናቶች በሰለጠነ የጤና ባለሙያ የጤና አገልግሎት አጠቃቀም አሰሳ አንዱ ክፍል ነው፡፡ የዚህ ክፍል ዓላማ በአካባቢው (ቀበሌው) ያሉ መረጃዎችን ለማሰባሰብ ነው፡፡

አተገባበር ፤ ይህንን ጥናት ለመተግበር መጀመሪያ የእርስዎን ፈቃደኝነት እናረጋግጣለን፡፡ ፈቃደኛ ከሆኑ የስምምነት ቅጹ ላይ ይፈርሙልናል፡፡
ተጓዳኝ ጉዳዮች፤ በዚህ ጥናት በመሳተፊዎ በሚያባክኑት ሰዓት ምክንያት ምሹት ላይሰማዎት ይችላል፡፡ በተረፈ ግን በጥናቱ መሳተፍ ምንም ዓይነት ጉዳት አያስከትልም ፡፡ ስለዚህ የሚሰጡት መረጃ ለእናቶቻችሁ ጤና አገልግሎት መሻሻል ጠቃሚ ግብዓት ይሆናል፡፡

ጥቅሞች፤ እርስዎ በዚህ ጥናት ተሳታፊ በመሆንዎ በቀጥታ ወይም በሌላ መንገድ የውጤቱ ተጠቃሚ ነዎት፡፡ ወደፊትም የርሶ ቤተሰብ እና ማህበረሰብ ተጠቃሚ የሚሆኑበት ጥናት ነው፡፡

ሌሎች ጥቅማጥቅሞች፤ በዚህ ጥናት ተሳታፊ በመሆኖዎ ምንም ዓይነት ማበረታቻ ወይም ክፍያ አይሰጠዎትም፡፡

ምስጢራዊነት፤ ከርሰዎ የምንወስደው መረጃ የግል ጉዳይ ባይመለከትም ከስም ውጭ በሆነ ኮድ እንድያዝ ጥንቃቄ ይደርግበታል፡፡ ከተመራማሪው ውጭ ለማንም አይሰጥም፤ በቀልፍ ተቆልፎ እንድቀመጥም ይደረጋል፡፡

ከጥናቱ ያለመሳተፍ ወይም የማቋረጥ መብት፤ በዚህ ጥናት ያለመሳተፍ መብትዎ ሙሉ በሙሉ የተጠበቀ ነው፡፡ ለጥያቄዎቹ በሙሉም ሆነ በከፊል መልስ አለመስጠት ይችላሉ፡፡ እንድሁም በማንኛውም ሰዓት ማንኛውንም መብትዎን ሳያጡ የማቋረጥ ሙሉ መብት አለዎት፡፡

ማግኘት የሚችሏቸው ሰዎች፤ ይህ የምርምር ፕሮጀክት በአድስ አበባ ዩኒቨርሲቲ የምርምርና ስነ ምግባር ቦርድ ተከልሶ ፀድቋል፡፡ የበለጠ መረጃ ማግኘት የሚፈልጉ ከሆኑ፤

አቶ አበባው ገበየሁን በስልክ ቁጥር 251_920314519 ወይም

በአድስ አበባ ዩኒቨርሲቲ ይህን ጥናት ያፀደቀውን የስነ ምግባር ኮሚቴ በስልክ ቁጥር 251_115538734,

e-mail: aaumfirb@yahoo.com ማግኝት ይችላሉ፡፡

የጥናት ተሳትፎ ፍቃድ መጠየቂያ ቅጽ

ከላይ የተሰጡትን መረጃዎች በማገናዘብና በመረዳት በጥናቱ ለመሳተፍ ፋቃደኛ ኖት?

አዎን

የተሳታፊ ፊርማ/የጣት አሻራ

ፊርማ/የጣት አሻራ _____ ቀን _____

(ወደ ቃለ-መጠይቁ ይለፉ)

የለም _____ (ቃለ-መጠይቁን ያቁሙ)

የመረጃ ሰብሳቢው ፊርማ

ስም _____ ፊርማ _____ ቀን _____ ሰዓት _____

የተቆጣጣሪው ፊርማ

ስም _____ ፊርማ _____ ቀን _____

	ወረዳ	ቀበሌ	የቤቱ ባለቤት	ቃለ መጠይቅ የሚደረግለት ሰው	መረጃ ሰብሳቢ ባለሙያ
ስም					
መለያ (ኮድ)					
መረጃው የተሰበሰበበት ቀን:			መረጃው የተሰበሰበበት ሰዓት:- ከ _____-እስከ _____		
በቀበሌው ያለዎት ኃላፊነት:			ዕድሜ: _____ የትምህርት ደረጃ: _____		

ምጣኔ ሀብትን በሚመለከት

ማስታወሻ: አባከዎ የገቢ ምንጮችንና የግብይት ስርዓት ይለዩ

1. የቀበሌው ህዝብ ዋነኛ የገቢ ምንጭ ምንድን ነው?
2. በቀበሌው ያለው ምርት በቂ ነው (ራሱን ይችላል)? ወይስ ምርት በሌለበት ወቅት ርዳታ ይፈልጋል? በየስንት ጊዜው? (በየዓመቱ፣ አንዳንድ ጊዜ)
3. ምርት የሚሸጥበት ቦታ የት ነው? የቤት ፍጆታ የሚገዛበት የገቢ ቦታስ? በአካባቢው የመገበያየት ቦታ አለ?

ትራንስፖርትና መገናኛ

ማስታወሻ: በእያንዳንዱ መንደር የሚጠቀሙባቸውን መገናኛና ትራንስፖርት ዘዴዎች ይለዩ

4. በቀበሌው ምን ዓይነት የመገናኛ ዘዴ አላችሁ? እየንዳንዱ መንደር መገናኛ ዘዴ አለው? ምን ዓይነት (ሞባይል፣ የቤት ስልክ)? ሁልጊዜ ይሰራል?
5. በቀበሌው ውስጥ ያሉ መንደሮች ምጥ ላይ ያሉ እናቶችን ሲያጓጉዙ ምን ዓይነት ትራንስፖርት ይጠቀማሉ? ሁሉም መንደሮች መንገድ አላቸው?

አባከዎ ተጠያቂው ሁሉንም መንደሮች እንድጠቅሱ ያድርጉ

እያንዳንዱ መንደር ከዋናው መንገድ ጋር ይገናኛል? እያንዳንዱ መንደር በቅርብ ከሚገኘው ጤና ጣቢያ ምን ያህል ይርቃል?

በቀበሌው ያሉ መንደሮች	የመገናኛ ስልክ ዓይነት	የመጓጓዣ ዓይነት	ከዋናው መንገድ ጋር ያለው		በቅርብ ከሚገኘው ጤና ጣቢያ ያለው ርቀት(ኪ.ሜ)
			ግንኙነት(አለ/የለም)	ርቀት(ኪ.ሜ)	
1					
2					
3					
4					
5					

ጤናና ትምህርት

6. በቀበሌው ምን ዓይነት የጤና ድርጅት አለ? ስሙ፣ ዓይነቱና ቁጥሩ ይጻፍ። በእያንዳንዱ መንደር ያሉ የጤና ተጠሪዎችና የልምድ አዋላጆችን ይመዝገቡ።

በቀበሌው ያሉ መንደሮች	የልምድ አዋላጅ ብዛት	የጤና ኤክስቴንሽን ባለሙያዎች ብዛት	የጤና ተጠሪዎች ብዛት
1			
2			
3			
4			
5			
ድምር			

በቀበሌው ምን ዓይነት ትምህርት ቤት አለ? ስሙ፣ ዓይነቱና ቁጥሩ ይጻፍ።

ማህበራዊ የመረዳጃ ስርዓቶች

7. በቀበሌው ውስጥ የገንዘብ አያያዝ ስርዓት አለ? ካለ ምን ዓይነት?
8. ህብረተሰቡ በምን ዓይነት መልኩ ይረዳዳል? በዚህ አካባቢ እድር ምን ይመስላል? ወላጆች ችግር ሲገጥማቸው ድጋፍ ያደርጋል?
9. በዚህ አካባቢ በእርግዝናና ወሊድ ጊዜ የሚደረጉ ባህላዊ አገልግሎቶች አሉ? ካሉ ምን? ህብረተሰቡ እንዴት ያከናውናቸዋል?

ለሰጡኝ ጠቃሚ መረጃ በጣም አመሰግናለሁ።

ከእናቶች፣ ባሎችና ተሰሚነት ካላቸው ታላቅ ሴቶች መረጃ ለመስብሰብ የተዘጋጀ ቃለ መጠይቅ

ይህ ቃለ መጠይቅ የሚካሄደው እናቶች፣ ባሎች (አባቶች)ና ተሰሚነት ያላቸው ታላቅ ሴቶች ስለሚያውቁት ባለፈው አንድ ዓመት ውስጥ በሰላም ስለወለደችና ከወሊድ በኋላ ጤናማ ለሆነች እናት ነው፡፡

መረጃ መስጫ ቅጽ

ቃለ መጠይቅ ለሚደረግለት ሰው ቅጹን ያንብቡላቸው፡፡

ጥናቱ የሚካሄድበት ዓላማ ፤ ይህ ጥናት በሰሜን ጎንደር የሚካሄደው የእናቶች በሰለጠነ የጤና ባለሙያ የጤና አገልግሎት አጠቃቀም አሰሳ አንዱ ክፍል ነው፡፡ የዚህ ክፍል ዓላማ እናቶች፣ ባሎች (አባቶች)ና ተሰሚነት ያላቸው ታላቅ ሴቶች በሰለጠነ ባለሙያ ስለሚሰጥ የእናቶች ጤና አገልግሎትና ስለሚደረግ የወሊድ ዝግጅት ያላቸውን ሚና ለማጥናት ነው፡፡

አተግባብር ፤ ይህንን ጥናት ለመተግበር መጀመሪያ የእርስዎን ፈቃደኝነት እናረጋግጣለን፡፡ ፈቃደኛ ከሆኑ የስምምነት ቅጹ ላይ ይፈርሙልናል፡፡

ተጓዳኝ ጉዳዮች ፤ በዚህ ጥናት በመሳተፊያ በሚያባክኑት ሰዓት ምክንያት ምቹት ላይሰማዎት ይችላል፡፡ በተረፈ ግን በጥናቱ መሳተፍ ምንም ዓይነት ጉዳት አያስከትልም ፡፡ ስለዚህ የሚሰጡት መረጃ ለእናቶቻህ ጤና አገልግሎት መሻሻል ጠቃሚ ግብዓት ይሆናል፡፡

ጥቅሞች ፤ እርስዎ በዚህ ጥናት ተሳታፊ በመሆንም በቀጥታ ወይም በሌላ መንገድ የውጤቱ ተጠቃሚ ነዎት፡፡ ወደፊትም የርሶ ቤተሰብ እና ማህበረሰብ ተጠቃሚ የሚሆኑበት ጥናት ነው፡፡

ሌሎች ጥቅማጥቅሞች ፤ በዚህ ጥናት ተሳታፊ በመሆኖም ምንም ዓይነት ማበረታቻ ወይም ክፍያ አይሰጠዎትም፡፡

ምስጢራዊነት ፤ ለዚህ የጥናት ፕሮጀክት የሚሰበሰበው መረጃ የግል ጉዳዮችህን ያካተተ በመሆኑ ማን ምን መልስ እንደሰጡ/ች ምስጢር እንዲሆን ጥንቃቄ ይደርግበታል፡፡ ከተመራማሪው ውጭ ለማንም አይሰጥም፤ በቁልፍ ተቆልፎ እንድቀመጥም ይደረጋል፡፡

ከጥናቱ ያለመሳተፍ ወይም የማቋረጥ መብት ፤ በዚህ ጥናት ያለመሳተፍ መብትዎ ሙሉ በሙሉ የተጠበቀ ነው፡፡ ለጥያቄዎቹ በሙሉም ሆነ በከፊል መልስ አለመስጠት ይችላሉ፡፡ እንድሁም በማንኛውም ሰዓት ማንኛውንም መብትዎን ሳይጡ የማቋረጥ ሙሉ መብት አለዎት፡፡

ማግኘት የሚችሏቸው ሰዎች፤

የበለጠ መረጃ ማግኘት የሚፈልጉ ከሆኑ፤

አቶ አበባው ገበየሁን በስልክ ቁጥር 251_920314519 ወይም

በአድሰ አበባ ዩኒቨርሲቲ ይህን ጥናት ያፀደቀውን የስነ ምግባር ኮሚቴ በስልክ ቁጥር 251_115538734,

e-mail: aaumfirb@yahoo.com ማግኘት ይችላሉ፡፡

የጥናት ተሳትፎ ፍቃድ መጠየቂያ ቅጽ

ከላይ የተሰጡትን መረጃዎች በማገናዘብና በመረዳት በጥናቱ ለመሳተፍ ፋቃደኛ ኖት?

አዎን

የተሳታፊ ፊርማ/የጣት አሻራ

ፊርማ/የጣት አሻራ _____ ቀን _____

(ወደ ቃለ-መጠይቁ ይለፉ)

የለም _____ (ቃለ-መጠይቁን ያቁሙ)

የመረጃ ስብሰቢዉ ፊርማ

ስም _____ ፊርማ _____ ቀን _____ ሰዓት _____

የተቆጣጣሪዉ ፊርማ

ስም _____ ፊርማ _____ ቀን _____

	ወረዳ	ቀበሌ	ቃለ መጠይቅ የሚደረግለት ሰው	መረጃ ስብሰቢ ባለሙያ
ስም				
መለያ (ኮድ)				
ቃለ መጠይቅ የሚደረግለት ሰው ዓይነት 1. እናት 2. ባል (አባት) 3. ተሰሚነት ያላት ታላቅ ሴት				
መረጃው የተሰበሰበበት ቀን፡			መረጃው የተሰበሰበበት ሰዓት፡- ከ _____-እስከ_____	
ቃለ መጠይቅ የሚደረግለት ሰው ዕድሜ፡			ቃለ መጠይቅ የሚደረግለት ሰው የትምህርት ደረጃ፡	

ቃለ መጠይቁ የሚመለከታት እናት ግሊዊ መረጃ

ወረዳ _____ ቀበሌ _____	የቤተሰብ ብዛት:
የትምህርት ደረጃ:	ዕድሜ:
የሥራ ዓይነት:	ኃይማኖት:
የወለዱበት ቀን (ግምታዊ): _____ ወር	ቀዶ ጥገና ሊሰራ ይሚችል ባቅራቢያ የሚገኝ ጤና ድርጅት:
የጤና ድርጅቱ ርቀት _____ ኪ.ሜ ለመድረስ የሚጠይቀው ገንዘብ _____ ብር የሚወስደው ጊዜ _____ ሰዓት	የወለዱበት ቦታ: (ቤት/ጤና ድርጅት) ያዋለደው ሰው: (ያለ ማንም አዋላጅ፤ ቤተሰብ፤ የልምድ አዋላጅ፤ የጤና ባለሙያ)
ከልምድ አዋላጁ ቤት ያለው ርቀት:	ጠቅላላ ርግዝና _____ ጠቅላላ ወሊድ _____ በህይወት የተወለደ ብዛት _____

የወሊድ ዝግጅት

ጥያቄዎች

1. ይህች እናት በቅርቡ በነበራት አርግዝና ወቅት የት ቦታ እንድትወልድ ተወያይችሁ? ውይይቱን ያካሄደው ማን ነበር? ይህ ቦታ ለምን ተመረጠ? ውይይት ካልተካሄደ፤ ለምን?
2. ምን ዓይነት የወሊድ ዝግጅት አደረጋችሁ? ትራኒስፖርት አዘጋጃችሁ? ገንዘብ አስቀመጣችሁ? ሌላ? ዝግጅቱን ያደረጋችሁት እንደት ነበር? ለምን ዝግጅት አደረጋችሁ? ማን ማን ተሳትፎ ነበር? ዝግጅት ከሌለ ለምን?
3. ለወሊድ ምን ያህል ገንዘብ ገምተው ነበር (ቦታው ይጠቀስ)? ለወሊድ የሚሆን ገንዘብ አስቀምጠው ወይም እቃዎች ገዝተው ነበር? ካልሆነ ለምን?
4. የወሊድ ዝግጅቱ እንኳን ባይኖር ምን መደረግ አለበት ይላሉ? ከዝግጅቶቹ ሁሉ እርስዎን የሚመለከተው የቱ ይመስለዎታል? ማን መሳተፍ ይገባዋል? መቼ ዝግጅት መደረግ አለበት? እንደት መካሄድ አለበት?

በሰለጠነ ባለሙያ የወሊድ አገልግሎት ማግኘት

ማስታወሻ: የወሊድ ቦታና አዋላጅ ምረጫ እነድሁም የገንዘብ ወጭ ላይ ያሉ ችግሮችን ይለዩ::

5. የመጨረሻውን ልጁን (የእናቱቱን ስም ይጥቀሱ) የት ወለደች? ለምን ከዚያ ቦታ ወለደች? ከቤት ውጭ ከወለደች ትራንስፖርት እንደት አመቻቻችሁ? ከቦታው ለመድረስ ምን ያህል ሰዓት ወሰደ? በርስዎ አመለካከት ለመውለድ ጥሩ ቦታ የሚሉት የት ነው? ለምን?
6. የመጨረሻውን ልጁን (የእናቱቱን ስም ይጥቀሱ) ስትገልግል ማን አዋለዳት? በአዋላጆች ምን ያህል ረከተዋል? በርስዎ አመለካከት በምጥና ወሊድ ጊዜ ጥሩ እንክብካ ያደርጋሉ የሚሉት አነማንን ነው? ለምን?
7. ወሊዱ ምን ያህል ገንዘብ ወሰደ? ለወሊድ ክፍያ መፈፀም ቀላል ወይስ ከባድ ነበር? ወጭውን ለመሸፈን ምን አደረጋችሁ?

ድህረ ወሊድ ጤና አገልግሎት

8. የመጨረሻውን ልጁን ከወለደች በኋላ (የእናቱቱን ስም ይጥቀሱ) ከትትል ለማድረግ ጤና ድርጅት ሄዳ ነበር? ከሄደች ማን ተከታተላት? ከትትሉ መቼ ነበር? ቦታውስ? ምን አደረጉላት? ከትትል ካልነበራት ለምን? በርስዎ አመለካከት በሰላም ለወለደችና ጤናማ ህፃን ላላት እናት ከትትል ማድረግ ጠቃሚ ነው ይላሉ? ለምን?
9. እንድት እናት ከወለደች በኋላ ከቤት መውጣት ብትፈልግ መውጣት ትችላለች? ለምን ያህል ጊዜ? ለምን? የተለዩ ሁኔታዎች አሉ?

ከወሊድ ጋር ተያይዘው ለሚከሰቱ ድንገተኛ አደጋዎች በሰለጠነ ባለሙያ አገልግሎት ማግኘት

10. እንዲት እናት ከወሊድ ጋር ተያይዘው የሚከሰቱ ምን ዓይነት ችግሮች ሊያጋጥማት ይችላል? በርግዝና ጊዜ የሚከሰቱ? በወሊድ ጊዜ የሚከሰቱ? ከወሊድ በኋላ የሚከሰቱ? ከነዚህ ሁሉ ከባድ የሚሉት የቱን ነው? ለምን?
11. የመጨረሻውን ልጁን (የእናቱቱን ስም ይጥቀሱ) ስታረግዝ፤ ለእንደዚህ ዓይነት ችግሮች ዝግጅት ነበር? ከነበረ ምን? ለምን? ማን ተሳትፎ አደረገ? ካልነበረ ለምን? እርስዎ ዝግጅት ነበረዎት? ከነበረዎት ምን ሆነ?
ሌላ የሚነግሩኝ ነገር አለ?

ለሰጡኝ ጠቃሚ መረጃ በጣም አመሰግናለሁ::

ክልምድ አዋላጆች መረጃ ለመሰብሰብ የተዘጋጀ ቃለ መጠይቅ

ይህ ቃለ መጠይቅ የሚካሄደው ባለፈው አንድ ዓመት ውስጥ አገልግሎት ከሰጡ የልምድ አዋላጆች ጋር ነው።

መረጃ መስጫ ቅጽ

ለልምድ አዋላጁ ቅጹን ያንብቡላቸው።

ጥናቱ የሚካሄድበት ዓላማ ፤ ይህ ጥናት በሰሜን ጎንደር የሚካሄደው የእናቶች በሰለጠነ የጤና ባለሙያ የጤና አገልግሎት አጠቃቀም አሰሳ አንዱ ክፍል ነው። የዚህ ክፍል ዓላማ የልምድ አዋላጆች አስተዋፆ እንድሁም ስለ ወሊድ ዝግጅትና የሰለጠነ ባለሙያ አጠቃቀም ላይ ያላቸውን አመለካከት ማወቅ ነው።

አተግባብ ፤ ይህንን ጥናት ለመተግበር መጀመሪያ የእርስዎን ፈቃደኝነት እናረጋግጣለን። ፈቃደኛ ከሆኑ የስምዎን ቅጹ ላይ ይፈርመላል። **ተጓዳኝ ጉዳዮች**፤ በዚህ ጥናት በመሳተፊዎ በሚያባክኑት ሰዓት ምክንያት ምሹት ላይሰማዎት ይችላል። በተረፈ ግን በጥናቱ መሳተፍ ምንም ዓይነት ጉዳት አያስከትልም ። ስለዚህ የሚሰጡት መረጃ ለእናቶችህ ጤና አገልግሎት መሻሻል ጠቃሚ ግብዓት ይሆናል።

ጥቅሞች፤ እርስዎ በዚህ ጥናት ተሳታፊ በመሆንዎ በቀጥታ ወይም በሌላ መንገድ የውጤቱ ተጠቃሚ ነዎት። ወደፊትም የርስዎ ቤተሰብ እና ማህበረሰብ ተጠቃሚ የሚሆኑበት ጥናት ነው።

ሌሎች ጥቅማጥቅሞች፤ በዚህ ጥናት ተሳታፊ በመሆኖዎ ምንም ዓይነት ማበረታቻ ወይም ክፍያ አይሰጠዎትም።

ምስጢራዊነት፤ ለዚህ የጥናት ፕሮጀክት የሚሰበሰበው መረጃ የግል ጉዳዮችህን ያካተተ በመሆኑ ማን ምን መልስ እንደሰጠ/ች ምስጢር እንዲሆን ጥንቃቄ ይደርግበታል። ከተመራማሪው ውጭ ለማንም አይሰጥም፤ በቁልፍ ተቆልፎ እንድቀመጥም ይደረጋል።

ከጥናቱ ያለመሳተፍ ወይም የማቋረጥ መብት፤ በዚህ ጥናት ያለመሳተፍ መብትዎ ሙሉ በሙሉ የተጠበቀ ነው። ለጥያቄዎቹ በሙሉም ሆነ በከፊል መልስ አለመስጠት ይችላሉ። እንድሁም በማንኛውም ሰዓት ማንኛውንም መብትዎን ሳይጡ የማቋረጥ ሙሉ መብት አለዎት።

ማግኘት የሚችሏቸው ሰዎች

የበለጠ መረጃ ማግኘት የሚፈልጉ ከሆኑ፤

አቶ አበበው ገበየሁን በስልክ ቁጥር 251_920314519 ወይም

በአድሰ አበባ ዩኒቨርሲቲ ይህን ጥናት ያፀደቀውን የስነ ምግባር ኮሚቴ በስልክ ቁጥር 251_115538734,

e-mail: aaumfirb@yahoo.com ማግኘት ይችላሉ።

የጥናት ተሳትፎ ፍቃድ መጠየቂያ ቅጽ

ከላይ የተሰጡትን መረጃዎች በማገናዘብና በመረዳት በጥናቱ ለመሳተፍ ፋቃደኛ ኖት?

አዎን

የተሳታፊ ፊርማ/የጣት አሻራ

ፊርማ/የጣት አሻራ _____ ቀን _____

(ወደ ቃለ-መጠይቁ ይለፉ)

የለም _____ (ቃለ-መጠይቁን ያቁሙ)

የመረጃ ሰብሳቢው ፊርማ

ስም _____ ፊርማ _____ ቀን _____ ሰዓት _____

የተቆጣጣሪው ፊርማ

ስም _____ ፊርማ _____ ቀን _____

	ወረዳ	ቀበሌ	ልምድ አዋላጅ	መረጃ ሰብሳቢ ባለሙያ
ስም				
መለያ (ኮድ)				
መረጃው የተሰበሰበበት ቀን:			መረጃው የተሰበሰበበት ሰዓት:- ከ -----እስከ-----	
የልምድ አዋላጁ ዕድሜ:			የልምድ አዋላጁ የትምህርት ደረጃ:	
የልምድ አዋላጁ ስልጠና ሁኔታ: የሰለጠነች/ያልሰለጠነች			በወሩ ውስጥ ያዋለችው ህፃናት ብዛት:	

የወሊድ ዝግጅት

ማስታወሻ: እባክዎ እናቶችና ቤተሰቦች ለወሊድ በሚያደርጉት ዝግጅት ላይ የልምድ አዋላጆችን ተሳትፎና አመለካከት ለማወቅ ይሞክሩ።

ጥያቄዎች

1. እናቶችና ቤተሰቦች ለወሊድ ምን ዓይነት ዝግጅት ያደርጋሉ? በዝግጅቱ ማን ማን ይሳተፋል? መቼ ነው ዝግጅት የሚደረገው?
2. እንደ ልምድ አዋላጅነትም፤ እናቶች ለወሊድ እንድዘጋጁ ምን ይረዷቸዋል? ሰላማዊ ወሊድ እንድኖር ምን ይመክራሉ? ንፁህ የመውለጃ ቦታ እንድኖር ምን ይመክሯቸዋል? እናቶችና ቤተሰቦች አስፈላጊ ነገሮችን ቀድመው እንድንዘብና ገንዘብ እንድንያስቀምጡ በምን መልኩ ትወያየላችሁ?
3. እናቶች ጤና ድርጅት ሄደው እንድወልዱ ድጋፍ አድርገው ያውቃሉ? ካደረጉ ምን ሰሩ? እንደት መከራቸው? ካላደረጉ ለምን? አንድነት እናት ጤና ድርጅት ለመውለድ ፈልጋ የርሰዎን ርዳታ ብትፈልግ ለመርዳት ፈቃደኛ ነዎት?

በሰለጠነ ባለሞያ የወሊድ አገልግሎት ማግኘት

ማስታወሻ: በእናቶች ምረጫ ላይ የልምድ አዋላጆችን ሚናና አመለካከት ለማወቅ ይሞክሩ፡፡

4. በወሊድ ጊዜ እናቶችን ለመርዳት ምን ያደርጋሉ? ወላጁ ምች እንድሰማት ምን ያደርጋሉ? ንጽህናው የተጠበቀ ወሊድ እንድኖር ምን ያደርጋሉ? ደም መፍሰስ ቢኖር ምን ርምጃ ይወስዳሉ? ህፃኑ ከተወለደ በኋላ ሙቀት እድያገኝ ምን ያደርጋሉ?
5. በርሰዎ አመለካከት በዚህ አካባቢ እናቶች የት መውለድ ይፈልጋሉ? ለምን?
6. በልምድ አዋላጅ መውለድ የሚፈልጉት እናቶች ምን ዓይነቶች ናቸው? እናቶች የልምድ አዋላጅ የሚመርጡበት ምክንያት ምን ይመስለዎታል?
7. በሰለጠነ ጤና ባለሞያ መውለድ የሚፈልጉት እናቶች ምን ዓይነቶች ናቸው? እናቶች የሰለጠነ ጤና ባለሞያ የሚመርጡበት ምክንያት ምን ይመስለዎታል?
8. የወሊድ አገልግሎት ሲሰጡ ምን ዓይነት ክፍያ ያገኛሉ? ምን ያህል? ወዳውኑ ይከፈለዎታል? መክፈል የማይችሉ ከሆነ ምን ያደርጋሉ? ድህረ ወሊድ ጤና አገልግሎት
ማስታወሻ: በድህረ ወሊድ ጤና አገልግሎት ላይ የልምድ አዋላጆችን ሚናና አመለካከት ለማወቅ ይሞክሩ፡፡
9. አንድ እናት ከወለደች በኋላ አብረዋት ለምን ያህል ጊዜ ይቆያሉ? በዚህ ጊዜ ለእናትዋ ምን ያደርጋሉ? ለህፃኑስ?
10. ያዋለዷትን እናት ከወሊድ በኋላ በየሰዓት ጊዜው ይጎበኛታል? በጉብኝቱ ወቅት ምን ያደርጋሉ? በርሰዎ አመለካከት በሰላም ለወለደችና ጤናማ ህፃን ላላት እናት በጤና ድርጅት ከትትል ማድረግ ጠቃሚ ነው ይላሉ? ለምን?

ከወሊድ ጋር ተያይዘው ለሚከሰቱ ድንገተኛ አደጋወች በሰለጠነ ባለሞያ አገልግሎት ማግኘት

ማስታወሻ: ከወሊድ ጋር ተያይዘው በሚከሰቱ ድንገተኛ አደጋወች ላይ የልምድ አዋላጆችን ሚናና ግንዛቤ ለማወቅ ይሞክሩ፡፡

11. አንዲት እናት ከወሊድ ጋር ተያይዘው የሚከሰቱ ምን ዓይነት ችግሮች ሊያጋጥማት ይችላል? በርግዝና ጊዜ የሚከሰቱ? በወሊድ ጊዜ የሚከሰቱ? ከወሊድ በኋላ የሚከሰቱ? ከነዚህ ሁሉ ከባድ የሚሉት የቱን ነው? ለምን?
12. እንደዚህ ዓይነት ችግር ሲከሰት በአብዛሃኛው ምን ያደርጋሉ? ወደ ጤና ድርጅት እንድትሄድ ያደርጋሉ? እንደት አድርገው ነው የሚልኳት? ለእንደህ ዓይነት ችግር ልምድ አዋላጆችን ምን ይመክራሉ? ጤና ድርጅቶችና ባለሞያወች ለእንደህ ዓይነት ችግር ያስፈልጋሉ ብለው ያስባሉ? ለምን?

ለሰለጠኝ ጠቃሚ መረጃ በጣም አመሰግናለሁ፡፡

ከወሊድ ጋር ተያይዘው ለሚከሰቱ ድንገተኛ አደጋወች መረጃ ለመሰብሰብ የተዘጋጀ ቃለ መጠይቅ

ይህ ቃለ መጠይቅ የሚካሄደው ባለፈው አንድ ዓመት ውስጥ ከወሊድ ጋር ተያይዘው የሚከሰቱ ድንገተኛ አደጋወች ላጋጠማት እናት ነው (እናት ከሌላች ቤተሰቦቿን ይጠይቁ)፡፡

መረጃ መስጫ ቅጽ

ቃለ መጠይቅ ለሚደረግለት ሰው ቅጹን ያንብቡላቸው፡፡

ጥናቱ የሚካሄድበት ዓላማ ፤ ይህ ጥናት በሰሜን ጎንደር የሚካሄደው የእናቶች በሰለጠነ የጤና ባለሞያ የጤና አገልግሎት አጠቃቀም አሰሳ አንዱ ክፍል ነው፡፡ የዚህ ክፍል ዓላማ ከወሊድ ጋር ተያይዘው ለሚከሰቱ ድንገተኛ አደጋወች በተለያዩ ደረጃወች የተወሰዱ ርምጃዎችን በጥልቀት ማየት ነው፡፡

አተገባባር ፤ ይህንን ጥናት ለመተግበር መጀመሪያ የእርስዎን ፈቃደኝነት እናረጋግጣለን፡፡ ፈቃደኛ ከሆኑ የስምምነት ቅጹ ላይ ይፈርመልናል፡፡ **ተጓዳኝ ጉዳዮች**፤ በዚህ ጥናት በመሳተፊዎ በሚያባክኑት ሰዓት ምክንያት ምሳሌ ላይ ሰማዎት ይችላል፡፡ በተረፈ ግን በጥናቱ መሳተፍ ምንም ዓይነት ጉዳት አያስከትልም ፡፡ ስለዚህ የሚሰጡት መረጃ ለእናቶቻቸው ጤና አገልግሎት መሻሻል ጠቃሚ ግብዓት ይሆናል፡፡

ጥቅሞች፤ እርስዎ በዚህ ጥናት ተሳታፊ በመሆንዎ በቀጥታ ወይም በሌላ መንገድ የውጤቱ ተጠቃሚ ነዎት፡፡ ወደፊትም የርሶ ቤተሰብ እና ማህበረሰብ ተጠቃሚ የሚሆኑበት ጥናት ነው፡፡

ሌሎች ጥቅማጥቅሞች፤ በዚህ ጥናት ተሳታፊ በመሆኖዎ ምንም ዓይነት ማበረታቻ ወይም ክፍያ አይሰጠዎትም፡፡

ምስጢራዊነት፤ ለዚህ የጥናት ፕሮጀክት የሚሰበሰበው መረጃ የግል ጉዳዮችህን ያካተተ በመሆኑ ማን ምን መልስ እንደሰጠ/ች ምስጢር እንዲሆን ጥንቃቄ ይደርግበታል፡፡ ከተመራማሪው ውጭ ለማንም አይሰጥም፤ በቁልፍ ተቆልፎ እንድቀመጥም ይደረጋል፡፡

ከጥናቱ ያለመሳተፍ ወይም የማቋረጥ መብት፤ በዚህ ጥናት ያለመሳተፍ መብትዎ ሙሉ በሙሉ የተጠበቀ ነው፡፡ ለጥያቄዎቹ በሙሉም ሆነ በከፊል መልስ አለመስጠት ይችላሉ፡፡ እንድሁም በማንኛውም ሰዓት ማንኛውንም መብትዎን ሳይጡ የማቋረጥ ሙሉ መብት አለዎት፡፡

ማግኘት የሚችላቸው ሰዎች

የበለጠ መረጃ ማግኘት የሚፈልጉ ከሆኑ፤

አቶ አበበው ገበየሁን በስልክ ቁጥር 251_920314519 ወይም

በኢሜል አበበ ዩኒቨርሲቲ ይህን ጥናት ያፀደቀውን የስነ ምግባር ኮሚቴ በስልክ ቁጥር 251_115538734,

e-mail: aaumfirb@yahoo.com ማግኘት ይችላሉ፡፡

	ወረዳ	ቀበሌ	ቃለ መጠይቅ የሚደረግላት እናት	መረጃ ሰብሳቢ ባለሙያ
--	-----	-----	---------------------	---------------

ስም			
መለያ (ኮድ)			
መረጃው የተሰበሰበበት ቀን፡	መረጃው የተሰበሰበበት ሰዓት፡- ከ -----እስከ-----		
የትምህርት ደረጃ፡	ዕድሜ፡		
የሥራ ዓይነት፡	ኃይማኖት፡		
የወለዱበት ቀን (ግምታዊ)፡-----ወር	ቀዶ ጥገና ሊሰራ ይሟችል ባቅራቢያ የሚገኝ ጤና ድርጅት፡		
የጤና ድርጅቱ ርቀት፡-----ኪ.ሜ ለመድረስ የሚጠይቀው ገንዘብ-----ብር የሚወስደው ጊዜ-----ሰዓት	የወለዱበት ቦታ፡ (ቤት/ጤና ድርጅት) ያዋለደው ሰው፡ (ያለ ማንም አዋላጅ፤ ቤተሰብ፤ የልምድ አዋላጅ፤ የጤና ባለሙያ)		
ከልምድ አዋላጁ ቤት ያለው ርቀት፡	ጠቅላላ ርግዝና----- ጠቅላላ ወሊድ----- በህይወት የተወለደ ብዛት-----		
የተከሰተው ችግር ዓይነት፡			

ድንገተኛ አደጋወች ላይቶ ማወቅ

ማስታወሻ፡ እባክዎ አደገኛ ችግሮችን ስለሚያሳዩ ጠቋሚ ምልክቶችን ቤት ውስጥ የሚያዘገቡ ምክንያቶችን ለማወቅ ይሞክሩ፡፡
ችግር በተከሰተበት ወቅት የሆነውን ነገር ይነገሩኝ፡፡

1. **ምልክቱ የታየው መቼ ነበር?** ቦታው የት ነበር? መጀመሪያ ችግሩን ማን አየው? አብሮ ማን ነበር? ሁሉም ሰው ችግር ስለመከሰቱ ተስማምቶ ነበር?
2. **ምልክቱ ምን ነበር?** የችግሩ ምንነትና ምክንያት ምንድን ነው ብላችሁ አስባችሁ ነበር?
3. **ችግሩን ለማቃለል ቤት ውስጥ የሞከራችሁት ነገር ነበር?** ምን ነበር? አረጋግጠው ይጻፉ፡፡

የጤና አገልግሎት ለማግኘት ውሳኔ ማሳለፍ

ማስታወሻ፡ እባክዎ ቤት ውስጥና ከቤት ውጭ የሚያዘገቡ ምክንያቶችን ለማወቅ ይሞክሩ፡፡

4. **ችግሩ አደገኛ መሆኑንና ከቤት ውጭ (በጤና ድርጅት) እርዳታ ማስፈለጉን የወሰነው ማን ነው?** በውሳኔው ሁሉም ተስማምቶ ነበር? ውሳኔ ላይ ለመድረስ ምን ያህል ጊዜ ወሰደ?
5. **ለችግሩ የት መሄድ ይቻላል ይመስለዎታል?** በወቅቱ የት ለመሄድ ተነጋግራችሁ ነበር? በመጨረሻ የት ወሰናችሁ? ይህ ለምን ተመረጠ? ማነው የወሰነው? ሁሉም ተስማምቶ ነበር?
6. **ከወሰናችሁ በኋላ ከቤት ከመውጣታችሁ በፊት ምን ዝግጅት አድርጓችሁ ነበር?** ዝግጅቶችን ለማድረግ ምን ያህል ጊዜ ወሰደ? በሁሉም ዘግጅቶች(ገንዘብ፤ ቁሳቁስ፤ መጓጓዣ)ምን ምን እንዳደረገ አረጋግጠው ይጻፉ፡፡
7. **ከቦታው (ስሙ ይገለጽ) እንደት ደረሱ?** አብሮ ማን ነበር? የትራንስፖርት ችግሩንና መዘግየት አረጋግጠው ይጻፉ፡፡
8. **ከቦታው ለመድረስ ምን ያህል ገንዘብ ወሰደ?** ካሰቡት አንፃር ወጭውን እንደት ያዩታል? እንደት ከፈሉ፤ በእጅ የነበረ ገንዘብ፤ ተበድረው፤ በሰው ርዳታ ወይስ ሌላ?

በጤና ድርጅት ውስጥ የተሰጠ አገልግሎት

ማስታወሻ፡ እያንዳንዱን አገልግሎት ጥራትና ወጭ ለማወቅ ይሞክሩ፡፡

9. **ከቦታው (ስሙ ይገለጽ) ሲደርሱ ምን ተከሰተ?** መጀመሪያ ያገኛችሁት ሰው ማን ነበር? ምን ምክር ሰጣችሁ? የሚረዳ ሰው ባካባቢው ነበር? ማን? ባለሞያ አስከሚያገኙ ምን ያህል ጊዜ ቆዩ?
10. **ምን ዓይነት ርዳታ አገኙ?** ባለሞያዎች ችግሩን ለማከም ምን አደረጉ?
11. **በተሰጠው አገልግሎት ምን ተሰማው?** ከተሰጡት አገልግሎቶች የወደዱትና የጠሉት ምንድን ነው?
12. **ለአገልግሎቱ ምን ያህል ከፈሉ?** ከፍያውን ለማሟላት ችግር ነበር?
ይህች እናት ሌላ ቦታ ሄደው ከሆነ ወደ ጥያቄ 7 ተመልሰው በተመሳሳይ ሁኔታ ጥያቄዎችን ይቀጥሉ፡፡

ከትትል ማድረግ

13. **ህክምና ከወሰዱ በኋላ ለምን ያህል ጊዜ ቆዩ?** በምን መልኩ ወደ ቤት ተመለሱ? ምን ዓይነት መጓጓዣ ተጠቀሙ? መጓጓዣው እንደት ተመቻቸ?
14. **ቤትዎ ሲመለሱ ራስዎን እንደት መርዳት እንዳለበወት ምን መከራዎት? ለከትትል እንድመጡ ምክር ሰጡዎት? ለመቸ? ማን መከረዎት?**
15. **በቤተሰብዎ ውስጥ እንድህ ዓይነት ችግር መልሶ ቢከሰት የተለየ ነገር ያደርጋሉ?** የሚደርጉት ምንድነው? ለምን?

ለሰጡኝ ጠቃሚ መረጃ በጣም አመሰግናለሁ፡፡

የከትትል ጥናት መረጃ መሰበሰቢያ ቅጽ

የመረጃ ሰብሳቢዎች መመሪያ

እባክዎ ከትትሉ እስከሚጠናቀቅ በቅደም ተከተሉ መሰረት ይሰሩ

1ኛ: በተመረጡ ቀበሌዎች ነፍሰ ጡር እናቶችን ያግኙ

ለጥናቱ የሚፈለጉት ቤቶች የድምግራፊና ጤና አሰሳ ቦታዎች አካል ናቸው። ነፍሰ ጡር እናቶችን ለማግኘት የጤና ተጠሪዎችንና ሌሎች አማራጮችን ይጠቀሙ።

2ኛ: በከትትል ጥናቱ ለመካተት የሚሰችል ፈቃደኝነት ያግኙ

ነፍሰ ጡር እናቶች ከተገኙ በኋላ ቅጹን ያንብቡላቸው። ፈቃደኝነታቸውንም ያረጋግጡ።

3ኛ: ግላዊ መረጃ ከተቀበሉ በኋላ ቀጠሮ ይሰጡ

የርግዝና ጊዜውን ከቆጠሩ በኋላ በ9ኛ ወር ውስጥ ቀጠሮ ይሰጡ።

4ኛ: የመጀመሪያውን አሰሳ ያድርጉ

የመጀመሪያው አሰሳ በእርግዝና መጨረሻ ወር ላይ ይካሄዳል። ነፍሰ ጡር እናት በ9ኛው ወሯ ከተገኘች ግላዊ መረጃዋን የመጀመሪያው አሰሳ በአንድ ላይ ይካሄዳል። በዚህ ወቅት ለሁለተኛው አሰሳ ከወሊድ በኋላ አንድ ሳምንት ውስጥ ቀጠሮ ይያዙ።

5ኛ: ሁለተኛውን አሰሳ ያድርጉ

ከትትል ጥናቱ ውስጥ ያሉ እናቶች ሁለተኛው አሰሳቸው ከወሊድ በኋላ አንድ ሳምንት ውስጥ ይደረጋል። የአሰሳ ቅጹን ከሞሉ በኋላ በ6ኛው ሳምንት ለሚደረገው የመጨረሻው አሰሳ ቀጠሮ ይያዙ።

6ኛ: ሦስተኛውን አሰሳ ያድርጉ

ይህ የመጨረሻው አሰሳ ይሆናል። ሁሉም መረጃ በቅጹ ይሞላል። እናቶች ወዴ ጤና ድርጅት ወይም ከትባት ባጢያ ከመጡ መረጃዎችን በዚህ ቦታ መሙላት ይቻላል።

ልዩ ሁኔታዎች:

ነፍሰ ጡር እናቶች ውርጃ ካጋጠማቸው ከትትላቸው በመጀመሪያው አሰሳ ይጠናቀቃል። በ2ኛና 3ኛ አሰሳ ላይ በውርጃ ምክንያት ከትትላቸው የተቋረጠ ተብሎ ይመዘገባል።

ነፍሰ ጡር እናቶች ሞቶ የተወለደ ህፃን (ከ28 ሳምንት በኋላ ሞቶ የተወለደ ህፃን) ካጋጠማቸው ወይም ህፃኑ ያለወቅቱ ከተወለደ የ2ኛና 3ኛው የኖራል። ነገር ግን በጊዜው መዛባት ምክንያት የመጀመሪያው አሰሳ ሊያልፍ ይችላል። ሥለዚህ በወቅቱ የማያስፈልጉ ጥያቄዎችን በመተው የመጀመሪያው ሁለተኛውን አሰሳ በአንድነት ይካሄዳሉ።

ፈቃደኝነት ማግኘት

መረጃ መስጫ ቅጽ: ለነፍሰ ጡር እናቶች ቅጹን ያንብቡላቸው።

የጥናት ፕሮጀክቱ የሚካሄድበት ዓላማ ፤

ይህ ጥናት በሰሜን ጎንደር የሚካሄደው የእናቶች በሰለጠነ የጤና ባለሞያ የጤና አገልግሎት አጠቃቀም አሰሳ አንዱ ክፍል ነው። የጥናቱ ዋና ዓላማ በሰለጠነ የጤና ባለሞያ የጤና አገልግሎት ማግኘትና አለማግኘት በእናቶችና ህጻናት ጤና ላይ ያለውን ተጽኖ ለማየት ነው። የጥናቱ ግኝት ችግሩን ለመፍታት በተለይም ደግሞ ጥናት በሚካሄድበት ቦታ፣ ትክክለኛ የሆነ የመፍትሄ አቅጣጫ ለመቅረብ እንደመነሻ መሠረት ያገለግላል።

አተገባበር ፤ ይህንን ጥናት ለመተግበር መጀመሪያ የእርስዎን ፈቃደኝነት እናረጋግጣለን። ፈቃደኛ ከሆኑ የስምምነት ቅጹ ላይ ይፈርሙልናል።

በዚህ መሰረትም በመረጃ ሰብሳቢዎቹ የሚሰጠውን ጥያቄዎች እንድንመልሱ እንጠይቃለን። ይህ ጥናት የከትትል ጥናት ነው። በዚህም መሰረት ሶስት ጊዜ ማለትም፤ በርግዝን ወቅት፣ ከወሊድ በኋላ አንድ ሳምንት ውስጥና ከወሊድ በኋላ በ6ኛው ሳምንት እንገነዘባለን።

ተጓዳኝ ጉዳዮች፤ በዚህ ጥናት በመሳተፊያ በሚያባክኑት ሰዓት ምክንያት ምቹት ላይሰማዎት ይችላል። በተረፈ ግን በጥናቱ መሳተፍ ምንም ዓይነት ጉዳት አያስከትልም ። ስለዚህ የሚሰጡት መረጃ ለእናቶቻችሁ ጤና አገልግሎት መሻሻል ጠቃሚ ግብዓት ይሆናል።

ጥቅሞች፤ እርስዎ በዚህ ጥናት ተሳታፊ በመሆንም በቀጥታ ወይም በሌላ መንገድ የውጤቱ ተጠቃሚ ነዎት። ወደፊትም የርስ ቤተሰብ እና ማህበረሰብ ተጠቃሚ የሚሆኑበት ጥናት ነው።

ሌሎች ጥቅማጥቅሞች፤ በዚህ ጥናት ተሳታፊ በመሆኖም ምንም ዓይነት ማበረታቻ ወይም ክፍያ አይሰጥዎትም።

ምስጢራዊነት፤ ለዚህ የጥናት ፕሮጀክት የሚሰበሰበው መረጃ የግል ጉዳዮችሁን ያካተተ በመሆኑ ማን ምን መልስ እንደሰጠ/ች ምስጢር እንዲሆን ጥንቃቄ ይደርግበታል። በቁልፍ ተቆልፎ እንድቀመጥም ይደረጋል።

ከጥናቱ ያለመሳተፍ ወይም የማቋረጥ መብት

በዚህ ጥናት ያለመሳተፍ መብትዎ ሙሉ በሙሉ የተጠበቀ ነው። ለጥያቄዎቹ በሙሉም ሆነ በከፊል መልስ አለመስጠት ይችላሉ። እንደሁም በማንኛውም ሰዓት ማንኛውንም መብትዎን ሳያጡ የማቋረጥ ሙሉ መብት አለዎት።

ማግኘት የሚችሏቸው ሰዎች

የበለጠ መረጃ ማግኘት የሚፈልጉ ከሆኑ፤

አቶ አበባው ገበየሁን በስልክ ቁጥር 251_920314519 ወይም

በአድሰ አበባ ዩኒቨርሲቲ ይህን ጥናት ያፀደቀውን የስነ ምግባር ኮሚቴ በስልክ ቁጥር 251_115538734,

e-mail: aaumfirb@yahoo.com ማግኝት ይችላሉ።

የጥናት ተሳትፎ ፍቃድ መጠየቂያ ቅጽ

አዎን

☐

የተሳታፊ ፊርማ/የጣት አሻራ _____ ቀን _____
 ፊርማ/የጣት አሻራ _____
 (ወደ ቃለ-መጠይቁ ይለፉ)

የለም ☐ (ቃለ-መጠይቁን ያቁሙ)
 የመረጃ ስብሰባው ፊርማ _____ ቀን _____ ሰዓት _____
 ስም _____

የተቆጣጣሪው ፊርማ _____ ቀን _____
 ስም _____

ግላዊ መረጃዎችን በሚመለከት

	ወረዳ	ቀበሌ	የቤቱ ባለቤት	ከትትል የሚደረግላት እናት	መረጃ ስብሰባ ባለሙያ
ስም					
መለያ (ኮድ)					
እርግዝናው ዕድሜ በሳምንት፡					
መረጃው የተሰበሰበበት ቀን፡-			መረጃው የተሰበሰበበት ሰዓት፡-ከ _____ እስከ _____		

ተ.ቁ	መጠይቅ	አማራጮች	ቀጣይ ጥያቄ
1	በዚህ ቀበሌ ምን ያህል ጊዜ ቆዩ?	ዓመት ሁለት	
2	የተወለዱበት ዓመትና ወር መቼ ነው?	ወር ዓመት 99. አላውቀውም	
3	የትምህርት ደረጃዎ አስከምን ድረስ ነው?	1. አልተማርኩም 2. እንደኛ ደረጃ (1-6) /ማንበብና መጻፍ/ 3. ሁለተኛ ደረጃ (8-10/12) 4. በቴክኒክ ትምህርት ሰርቲፊኬት 5. ዲፕሎማ 6. ዲግሪና ከዚያ በላይ	
4	የባለቤትዎ/ጓደኛዎ የትምህርት ደረጃ?	1. አልተማረም 2. እንደኛ ደረጃ (1-6) /ማንበብና መጻፍ/ 3. ሁለተኛ ደረጃ (8-10/12) 4. በቴክኒክ ትምህርት ሰርቲፊኬት 5. ዲፕሎማ 6. ዲግሪና ከዚያ በላይ	
5	ሃይማኖትዎ ምንድን ነው?	1. ኦርቶዶክስ 2. ካቶሊክ 3. ፕሮቴስታንት 4. ሙስሊም ሌላ (ይጠቀስ)	
6	ብሄርዎ ምንድን ነው? እባክዎ ዋናውን ብሄር ይመዝግቡ	1. አማራ 2. ትግሬ 3. አገው ሌላ (ይጠቀስ)-----	
7	እርሰዎ የሚሰሩት ስራ ምንድን ነው?	1. ግብርና 2. ንግድ 3. የመንግስት ሰራተኛ ሌላ (ይጠቀስ)-----	
8	የባለቤትዎ ስራ ምንድን ነው?	1. ግብርና 2. ንግድ 3. የመንግስት ሰራተኛ	

		ሌላ (ይጠቀስ)-----	
9	በአሁኑ ሰዓት የጋብቻዎ ሁኔታ ምን ላይ ነው?	1. ብቸኛ ነኝ 2. አግብቻለሁ 3. ፈትቻለሁ 4. ባሌ ሞቷል ሌላ (ይጠቀስ) -----	
10	በቤታችሁ ውስጥ ምን ያህል የቤተሰብ አባል አለ?	የቤተሰብ አባል ብዛት-----	
11	ከጠቅላላ እርግዝናዎ ውስጥ በህይወት የተወለዱት ህፃናት ስንት ናቸው? እባክዎ በህይወት ተወልደው ወዳውኑ የሞቱትን ካርጋገጡ በኋላ ጨምረው ይመዝግቡ	ጠቅላላ እርግዝና ብዛት----- ጠቅላላ በህይወት የተወለዱ ብዛት.....	
12	ከጠቅላላ እርግዝናዎ ውስጥ ሞተው (ጠፍተው) የተወለዱት ህፃናት ስንት ናቸው?	ጠቅላላ ሞተው የተወለዱ ብዛት.....	
13	ማንኛውም ውርጃ	ጠቅላላ ውርጃ-----	
14	ይህንን እርግዝና ፈልገውት፤ ፈልገውት ነገር ግን ቆይቶ መምጣት ያለበት ወይስ ሳይፈልጉት ነበር?	1. ፈልገውት 2. ፈልገውት ነገር ግን መቆየት የነበረበት 3. ያልተፈለገ	15 - 15
15	ምን ያህል ጊዜ መቆየት ይፈልጉ ነበር?	ወር..... ዓመት..... 99. አላውቅም	
16	እርግዝናውን ለመከላከል የወሊድ መከላከያ ተጠቅመው ነበር?	0. የለም 1. አዎ	
17	ምን ዓይነት መከላከያ ተጠቀሙ ?	1. የሚዋጥ 2. በመርፌ የሚሰጥ 3. በማህፀን የሚገባ 4. ኮንዶም ሌላ (ይገልጽ) -----	
እባክዎ የእርግዝና ወራቱን አስበው በ 9ኛው ወር ላይ ቀጠሮ ይያዙ። አመሰግናለሁ! ይበሉ			

የመጀመሪያው ግምገማ

	ወረዳ	ቀበሌ	የቤቱ ባለቤት	ከትትል የሚደረግላት እናት	መረጃ ሰብሳቢ ባለሙያ
ስም					
መለያ (ኮድ)					
የእርግዝናው ዕድሜ በሳምንት፡ _____					
መረጃው የተሰበሰበበት ቀን፡- _____			መረጃው የተሰበሰበበት ሰዓት፡-h _____ እስከ _____		
የነፍሰ ጡር እናቶች ጠቃሚ የጤና አገልግሎት አሰላ (101-122)					
የሚከተሉት ጥያቄዎች የተዘጋጁት አንዲት እናት በእርግዝና ወቅት በተለያዩ ባለሞያዎች የወሰደቻቸውን ጠቃሚ አገልግሎቶች ለመመዝገብ ነው።					
ተ. ቁ	መጠይቅ	አማራጮች			ቀጣይ ጥያቄ
101	በዚህ እርግዝና ከትትል አድርገው ነበር?	0. የለም 1. አዎ			- 1 03
102	የርግዝና ከትትል ያላደረጉበት ምክንያት ምንድነው? የተጠቀሱትን ምክንያቶች ይጻፉ	ምክንያቶች፡			123
103	ለምን ያህል ጊዜ ከትትል አደረጉ?	ጊዜ..... 99. አላስታውስም			
104	የርግዝና ከትትሉን ያደረጉት የት ቦታ ነው?	1. ቤት ውስጥ 2. ከመንግስት ሆስፒታል 3. ከመንግስት ጤና ጣቢያ 4. ከመንግስት ክሊኒክ 5. ከግል ክሊኒክ ሌላ _____			

105	ከትትል ሲያደርጉ ያየውት ምን ዓይነት ባለሞያ ነው? በተለያዩ ጊዜ የተለያዩ ባለሞዎች አገልግሎት ከሰጡ በደረጃ ከፍ ያሉትን ይምረጡ	1. ዶክተር 2. ጤና መኮነን 3. ነረስ/አዋላጅ ነርስ 4. የጤና ኤክስቴንሺን ባለሞያ 5. የልምድ አዋላጅ ሌላ (ይጠቀስ) _____ 99. አላውቅም			
በከትትሎች ወቅት እናቶች የጤና አገልግሎት ካገኙ (‘X’ ምልክት ያድርጉ) (የመረጃ ምንጭ:- ከነፍሰ ጡር እናቶች የሚሰጥ ምላሽ እንድሁም ቻርትና መድኃኒቶችን በማየት)					
		የለም (0)	አዎ (1)	አላስታውስም /አላውቅም/(99)	
106	የደም ግፊት ተለክቷል				
107	ክብደት ተመዝኗል				
108	ኤችኤቪ ምርመራ ተደርጓል				
109	አባላዘር (ቁጥኝ) ምርመራ ተደርጓል				
110	ሽንት ምርመራ ተደርጓል				
111	የቴታነስ (መንጋጋ ቆልፍ) ክትባት ወስደዋል				
112	የወባ መከላከያ መድኃኒት ወስደዋል				
113	የደም ማነስ መድኃኒት ወስደዋል				
114	ስለ አመጋገብ ምክር ተሰጥቷል				
115	ስለ ፅንሱ እድገት መረጃ ተሰጥቷል				
116	በወሊድ ወቅት ስለሚደረግ ዝግጅት ውይይት ተደርጓል				
117	ስለ ወሊድ ቦታ ውይይት ተደርጓል				
118	በርግዝና ወቅት ስለሚከሰቱ አደገኛ ምልክቶች መረጃ ተሰጥቷል				
119	በወሊድ ወቅት ስለሚከሰቱ አደገኛ ምልክቶች መረጃ ተሰጥቷል				
120	ከወሊድ በኋላ ስለሚከሰቱ አደገኛ ምልክቶች መረጃ ተሰጥቷል				
121	ከእርግዝና ጋር ተያይዘው የሚመጡ አደገኛ ችግሮች በሚከሰቱበት ወቅት ስለሚደረጉ ዝግጅቶች ውይይት ተደርጓል				
122	በአጠቃላይ ባገኙት አገልግሎት ረከተው ነበር?				
የባህሪ ለውጥ ግምገማ (123-127)					
123	ከወሊድ ጋር ተያይዘው ለሚከሰቱ ድንገተኛ አደጋዎች የሚሆኑ ምልክቶችን መጥቀስ ይችላሉ? ከቻሉ ምን ምን ናቸው?	ምልክቶች 1. 2. 3.			
እናትና ቤተሰብ ተወያይተው ውሳኔ የደረሱባቸው ካሉ X’ ምልክት ያድርጉ::					
		የለም (0)	አዎ (1)	አላስታውስም /አላውቅም/(99)	
124	የት እንደሚወልዱ ተወያይታችሁ ወሰናችሁ? ከተወሰነ ቦታው ይጠቀስ _____				
125	ስለ መጓጓዣ ወሰናችሁ?				
126	ደም ሊለግስ የሚችል ሰው አዘጋጃችሁ?				
127	ለወሊድ የሚሆን ገንዘብ አዘጋጃችሁ?				
ያጋጠመ ህመም (የጤና ችግር) ግምገማ (128-130) ያጋጠመ ህመም ካለ ላስፈላጊው ህክምና ውይይት ይደረግ::					
128	አሁን ህመም አለውት? ካለ ይመዝገብ-----	0. የለም 1. አዎ			
129	ከርግዝና ጋር ተያይዘው የሚከሰቱ ከባድ የጤና ችግሮች አጋጥሞዎት ነበር? መኖሩን ያረጋግጡ	0. የለም 1. አዎ			- 130
130	ምን ዓይነት የጤና ችግር ገጠመዎት?	1. የደም ግፊት 2. ማንቀጥቀጥና ራስ መሳት 3. የደም መፍሰስ			

		4. ከባድ የደም ማነስ 5. የሰውነት ማበጥ 6. ህፃን በማህፀን ሳለ መሞት ሌላ (ይጠቀስ)-----	
የወሊድ ጊዜውን አስበው ከወሊድ በኋላ አንድ ሳምንት ውስጥ ቀጠሮ ይያዙ። አመሰግናለሁ! ይበሉ			

ሁለተኛው ግምገማ

	ወረዳ	ቀበሌ	የቤቱ ባለቤት	ክትትል የሚደረግለት እናት	መረጃ ስብሰባ ባለሙያ
ስም					
መለያ (ኮድ)					
የህፃኑ ዕድሜ በቀናት፡					
መረጃው የተሰበሰበበት ቀን፡-			መረጃው የተሰበሰበበት ሰዓት፡-ከ እስከ		
በወሊድ ጊዜ የሚሰጡ ጠቃሚ የጤና አገልግሎት ግምገማ (201-219) የሚከተሉት ጥያቄዎች የተዘጋጁት አንዲት እናት በወሊድ ወቅት በተለያዩ ባለሙያዎች የወሰደቻቸውን ጠቃሚ አገልግሎቶች ለመመዝገብ ነው።					
ተ. ቁ	መጠይቅ	አማራጮች	ቀጣይ ጥያቄ		
201	በወሊድ ጊዜ ምን ዓይነት ባለሙያ አዋለደዎት?	1. ዶክተር 2. ጤና መኮንን 3. ነርስ/አዋላጅ ነርስ 4. የልምድ አዋላጅ 5. ጤና ኤክስቴንሽን ባለሙያ 6. ቤተሰብ/ጓደኛ ሌላ (ይገልጽ) ----- 99. አላውቅም/አላስታውስም			
202	ህፃኑን (ስም) የት ወለዱት? በመንገድ ላይ ከተወለደ ቤት እንደተወለደ ይቆጠር	1. ቤት ውስጥ 2. በመንግስት ሆስፒታል 3. በመንግስት ጤና ጣቢያ 4. በመንግስት ጤና ኬላ 5. በግል ክሊኒክ 6. በልምድ አዋላጅ ቤት ውስጥ ሌላ			
በወሊድ ወቅት እናቶች የጤና አገልግሎት ካገኙ (‘X’ ምልክት ያድርጉ) (የመረጃ ምንጭ፡- ከእናቶች የሚሰጥ ምላሽ እንደሁም ቻርትና መድኃኒቶችን በማየት)					
		የለም (0)	አዎ (1)	አላስታውስም /አላውቅም/(99)	
203	የደም ግፊት ተለክቷል?				
204	ስለ ምጡ መረጃ ተሰጥቷል?				
205	ስለ ህፃኑ ጤንነት መረጃ ተሰጥቷል?				
206	የምጥ መከታተያ ካርድ ተጠቅመዋል?				
207	ጥንቃቄ የተደረገበት ወሊድ ተከናውኗል?				
208	ደም እንዳይፈስ መከላከያ ሰጡዎት?				
209	ለህፃኑ አስፈላጊውን ሁሉ ተደርጓል (መቀት፣አስትንፋስ ወዘተ)?				
210	የህፃኑ ክብደት ተለክቷል?				
211	ለህፃኑ ክትባት ሰጡ?				
212	ስለ ጡት ማጥባት ምክር ተሰጥቷል?				
213	ስለ ህፃኑ እንክብካቤ ምክር ተሰጥቷል?				
214	ስለ አመጋገብ ምክር ተሰጥቷል?				
215	ስለ ቤተሰብ ምጣኔ ምክር ተሰጥቷል?				
216	ጤና ድርጅት መቸ አንደሚሄዱ ተነግሯል?				
217	ከእርግዝና ጋር ተያይዘው የሚመጡ አደገኛ ችግሮች በሚከሰቱበት ወቅት ስለሚደረጉ ዝግጅቶች ውይይት ተደርጓል?				

218	በአጠቃላይ ባገኙት አገልግሎት ረከተው ነበር?				
የባህሪ ለውጥ ግምገማ (219-222)					
እናትና ቤተሰብ ተወያይተው ውሳኔ የደረሱባቸው ካሉ X' ምልክት ያድርጉ::					
		የለም (0)	አዎ (1)	አላስታውስም /አላውቅም/(99)	
219	ቤት ውስጥ መዘግይት ታይቷል				
220	ወሊድ በጤና ድርጅት ተካሂዷል				
221	በሰለጠነ ባለሙያ ወሊድ ተካሂዷል				
222	የወሊድ ወጭ በራስ ተሸፍኗል				
ያጋጠመ ህመም (የጤና ችግር) ግምገማ (224-226)					
ያጋጠመ ህመም ካለ ላስፈላጊው ህክምና ውይይት ይደረግ::					
223	አሁን ህመም አለው? ካለ ይመዝገብ-----	0. የለም 1. አዎ			
224	አሁን ህፃኑ ህመም አለው? ካለ ይመዝገብ-----	0. የለም 1. አዎ			
225	ከርግዝና ጋር ተያይዘው የሚከሰቱ ከባድ የጤና ችግሮች አጋጥሞቻት ነበር? መኖሩን ያረጋግጡ	0. የለም 1. አዎ			- 226
226	ምን አይነት የጤና ችግር ገጠመዎት?	1. የደም ግፊት 2. ማንቀጥቀጥና ራስ መሳት 3. ለረጅም ጊዜ ማማጥ 4. የደም መፍሰስ 5. ህፃን በማህፀን ሳለ መሞት 6. ትኩሳት (ኢነፌክሽን) 7. ፊስቱላ ሌላ (ይጠቀስ)-----			
ጊዜውን አስበው ከወሊድ በኋላ 6 ሳምንት ላይ ቀጠሮ ይያዙ:: አመሰግናለሁ! ይበሉ					
ባጋጠሙ ችግሮች ምክንያት የናት ሞት ከተከሰተ ምክንያቱን ከቤተሰቡ ጋር ተወያይተው የመዝግቡ:: ቀጣይ ክትትሉም በእናት ሞት ምክንያት ይቋረጣል::					

ሦስተኛው ግምገማ

	ወረዳ	ቀበሌ	የቤቱ ባለቤት	ክትትል የሚደረግላት እናት	መረጃ ሰብሳቢ ባለሙያ
ስም					
መለያ (ኮድ)					
የህፃኑ ዕድሜ በቀናት፡_____					
መረጃው የተሰበሰበበት ቀን፡-_____			መረጃው የተሰበሰበበት ሰዓት፡-ከ _____ እስከ _____		
በድህረ ወሊድ ጊዜ የሚሰጡ ጠቃሚ የጤና አገልግሎት ግምገማ (301-314)					
የሚከተሉት ጥያቄዎች የተዘጋጁት አንዲት እናት በድህረ ወሊድ ወቅት በተለያዩ ባለሞያዎች የወሰደቻቸውን ጠቃሚ አገልግሎቶች ለመመዝገብ ነው፡፡					
ተ. ቁ	መጠይቅ			አማራጮች	ቀጣይ ጥያቄ
301	ህፃኑን (ስም) ከወለዱ በስድስት ሳምንት ጊዜ ውስጥ የድህረ ወሊድ ምርመራ አድርገዋል?			0. የለም 1. አዎ	- 303
302	የድህረ ወሊድ ምርመራ ያላደረጉበት ምክንያት ምንድነው? የተጠቀሱትን ምክንያቶች ይጻፉ			ምክንያቶች:	315
303	የድህረ ወሊድ ምርመራ የት ወሰዱ?			1. ቤት ውስጥ 2. በመንግስት ሆስፒታል 3. በመንግስት ጤና ጣቢያ 4. በመንግስት ጤና ኬላ 5. በግል ክሊኒክ 6. በልምድ አዋላጅ ቤት ውስጥ ሌላ	

304	በወሊድ ጊዜ ምን ዓይነት ባለሞያ አዋለደዎት? በተለያዩ ጊዜ የተለያዩ ባለሞዎች አገልግሎት ከሰጡ በደረጃ ከፍ ያሉትን ይምረጡ	1. ዶክተር 2. ጤና መኮነን 3. ነርስ/አዋላጅ ነርስ 4. ጤና ኤክስቴንሽን ባለሞያ 5. የልምድ አዋላጅ ሌላ (ይገልጽ) ----- 99. አላውቅም/አላስታውስም			
በደህረ ወሊድ ወቅት እናቶች የጤና አገልግሎት ካገኙ ‘X’ ምልክት ያድርጉ (የመረጃ ምንጭ:- ከእናቶች የሚሰጥ ምላሽ እንድሁም ቻርትና መድኃኒቶችን በማየት)					
		የለም (0)	አዎ (1)	አላስታውስም /አላውቅም/(99)	
305	የደም ግፊት ተለክቷል?				
306	የማህፀን ፈሳሽ መኖር አለመኖሩ ታይቷል?				
307	የደም መፍሰስ መኖር አለመኖሩ ታይቷል?				
308	የጡት ምርመራ ተደርጓል?				
309	የወባ መከላከያ መድኃኒት ወስደዋል?				
310	ስለ ቤተሰብ ምጣኔ ምክር ተሰጥቷል?				
311	ስለ ጡት ማጥባት ምክር ተሰጥቷል?				
312	ስለ ህፃኑ እንክብካቤ ምክር ተሰጥቷል?				
313	ስለህፃኑ ክትባት ምክር ተሰጥቷል?				
314	በአጠቃላይ ባገኙት አገልግሎት ረከተው ነበር?				
የባህሪ ለውጥ ግምገማ (315-318)					
እናትና ቤተሰብ የሚከተሉትን ጉዳዮች ፈፅመው ከሆነ ‘X’ ምልክት ያድርጉ::					
		የለም (0)	አዎ (1)	አላስታውስም /አላውቅም/(99)	
315	በጤና ድርግት የድህር ወሊድ ክትትል አድረገዋል				
316	የርግዝና መከላከያ ጀምረዋል				
317	ህፃኑ ጡት ብቻ እንድመገብ አድርገዋል				
318	ህፃኑ ክትባት ጀምሯል				
ያጋጠመ ህመም (የጤና ችግር) ግምገማ (319-321) ያጋጠመ ህመም ካለ ላስፈላጊው ህክምና ውይይት ይደረግ::					
319	አሁን ህመም አለወት? ካለ ይመዝገብ-----	0. የለም 1. አዎ			
320	አሁን ህፃኑ ህመም አለው? ካለ ይመዝገብ-----	0. የለም 1. አዎ			
321	ከርግዝና ጋር ተያይዘው የሚከሰቱ ከባድ የጤና ችግሮች አጋጥሞዎት ነበር? መኖሩን ያረጋግጡ	0. የለም 1. አዎ			- 322
322	ምን ዓይነት የጤና ችግር ገጠመዎት?	1. ማንቀጥቀጥና ራስ መሳት 2. የደም መፍሰስ 3. ትኩሳት (ኢነፌክሽን) 4. ፊስቱላ 5. የህፃን መሞት ሌላ (ይጠቀስ)-----			
ለእናትዮቹና ለቤተሰቡ የጤና ትምህርት ይሰጡ:: ይህ የመጨረሻው ክትትል ነው:: አመሰግናለሁ! ይበሉ					

ANNEX 3: Declaration

Letter for declaration

I, the under signed, declared that this is my original work, has never been presented in this or any other University, and that all the resources and materials used for the dissertation, have been fully acknowledged.

Name: _____

Signature: _____

Date: _____

Place: _____

Date of Submission: _____

**This dissertation has been submitted for examination with my approval as
University Supervisor.**

Name: _____

Signature: _____

Date: _____