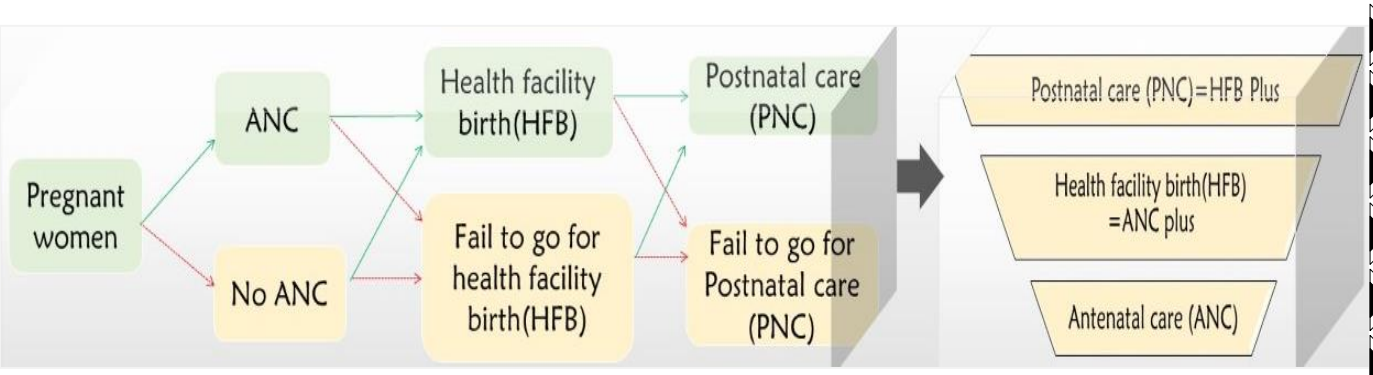
JIMMA UNIVERSITY

INSTITUTE OF HEALTH

SCHOOL OF GRADUATE STUDIES

MATERNAL HEALTHCARE IN JIMMA ZONE: A PARADOX IN THE CONTINUUM OF CARE COMPLETION AND BIRTH OUTCOMES



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JIMMA, ETHIOPIA

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MATERNAL HEALTHCARE IN JIMMA ZONE: PARADOX IN THE CONTINUUM OF CARE COMPLETION AND BIRTH OUTCOMES.

A Ph.D. THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES, JIMMA UNIVERSITY, FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE DEGREE OF DOCTOR OF PHILOSOPHY IN PUBLIC HEALTH, REPRODUCTIVE HEALTH

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THESIS APPROVAL

JIMMA UNIVERSITY

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Thesis title: Maternal healthcare in Jimma zone: Paradox in the continuum of care completion and birth outcomes.

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Maternal healthcare in Jimma zone: Paradox in the continuum of care completion and birth outcome. A multi-method research design.

Dedication

This thesis is dedicated to the countless mothers and newborns in low- and middle-income countries who have lost their lives or are facing unimaginable hardship due to limited access to maternal and newborn healthcare. Their stories illuminate the heartbreaking reality that we are too far from providing fundamental care for a safe pregnancy and childbirth. This work aims to contribute knowledge that can help pave the way for improved maternal health in the future.

Acknowledgments

First and foremost, I would like to thank the Almighty God for guiding me on this journey, holding my hand at every turn, and giving me the courage and fortitude to believe in my passion and pursue my study. My deepest gratitude goes out to my supervisors, prof. Muluemebet Abera and Dr. Garumma Tolu, for their unwavering efforts in guiding me and providing constructive feedback throughout this extensive work process.

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The completion of this work could not have been accomplished without the help I received from my family, and words cannot express my gratitude to my parents, wife (Chaltu Getachew), and kids (Firanat and Furtu Sena). Without them, I am nothing, and their belief in me has kept my spirits and motivation high and backed me throughout the academic trajectory.

Thesis Structure

This thesis is divided into ten sections. **Section I** consists of a general introduction with four sub-sections. It starts with background information about maternal healthcare, followed by general information, a country profile, the healthcare system, and maternal healthcare in Ethiopia. **Section II** briefly presents the study's overall aims, research questions, and hypotheses and the study framework. **Section III** provides an explanation and justification for the research methodology used and the data collection methods, with particular focus on the scope and population parameters used, and a description of ethical approval. **Sections IV** to **VII** present the four papers. **Section VIII** deals with the general discussion of the main findings and methodological considerations, with an emphasis on design, validity, reliability, generalizability, and ethical considerations. **Section IX** presents the conclusion and implications of the study, including avenues for future research. **Section X** is the reference list. Finally, the subject information sheet, consent form, questionnaires and interview guides, and CVs of the students are appendixed in a separate section.

List of papers

This thesis work is based on the following review and three original papers, which are listed here under:

I. Kitila SB, Feyissa GT, Olika AK, Wordofa MA. Maternal Healthcare in Low- and Middle-Income Countries: A Scoping Review. Health Serv Insights. 2022 May 21; 15:11786329221100310. Doi: 10.1177/11786329221100310. PMID: 35615600; PMCID: PMC9125054.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9125054/

II. Kitila SB, Feyissa GT, Wordofa MA. Completion of the Maternal Health Care Continuum-Barriers and Facilitators among Pregnant Women in Jimma Zone, Southwest Ethiopia: A Prospective follow-up Study. Health Serv Insights. 2023 Nov 30; 16:11786329231214607. Doi: 10.1177/11786329231214607. PMID: 38046557; PMCID: PMC10691321.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10691321/

III. Kitila, S.B., Feyissa, G.T. & Wordofa, M.A. Why do women walk away from maternal health services in southwest Ethiopia? A qualitative study of caregivers' and clients' perspectives. BMC Women's Health 23, 83 (2023).
https://doi.org/10.1186/s12905-023-02207-4

IV. The effect of the continuum of maternal healthcare completion on birth outcomes in southwest Ethiopia: a prospective follow-up study (Under review)

Executive summary

Background: The continuum of maternal healthcare, covering preconception to postpartum care, is a key aspect of maternal and child health programs. The current focus is on enhancing the integration of antenatal care, institutional delivery, and postnatal care. However, despite advancements, the completion of this continuum remains suboptimal and underdocumented in low- and middle-income countries, including Ethiopia. This study aims to provide insights into the continuum of maternal healthcare in the context of primary healthcare.

Objective: The overarching objective of this Ph.D. study was to generate evidence related to maternal healthcare continuum in the context of primary healthcare in Jimma Zone, southwest Ethiopia

Methods: A multimethod research design was employed from July 2020 to June 2021. Cluster sampling was used to select 1065 pregnant women for follow-up, which lasted from pregnancy until 42 days postpartum. Purposive sampling was used for the review and the qualitative study. A pretested, semi-structured, interviewer-administered questionnaire was used for quantitative data collection, along with an interview guide for qualitative.The data were collected, entered using Epi-data, and analyzed with SPSS and Stata software. Summary statistics and proportions were computed for descriptive analyses. Principal Component Analysis (PCA) was used to determine the socioeconomic index. Binary logistic regression was employed to determine potential variables for a multivariate analysis. Subsequently, a multivariate analysis was conducted to identify associations between the dependent and independent variables. Additionally, propensity score matching (PSM) model was fitted to examine the the effect of completion of maternal healthcare on birth outcomes. The strength of associations was demonstrated using odds ratios and β-coefficients along with the 95% CI. The qualitative data were transcribed, coded, categorized, and analyzed thematically, and the review also described narratively.

Results: The study revealed that the completion of the continuum of maternal healthcare was 16.1%, while the rate of unfavorable birth outcomes was 7.2%. Being from semi-urban (AOR: 1.73 95% CI: 1.07, 2.81), college and above partner education (AOR: 5.60

95% CI: 2.40, 13.08), women's being a governmental employee (AOR: 2.57 95% CI: 1.28, 5.16), knowledge of ANC (AOR: 7.64 95% CI: 4.03, 14.48), knowledge of PNC (AOR: 4.88 95% CI: 3.21, 7.42), having complete service during ANC contacts (AOR: 3.39 95% CI: 1.94, 5.93), parity (AOR: 1.86 95% CI: 1.11, 3.12), early booking for ANC (AOR: 2.10 95% CI: 1.45, 3.03), and having supportive care (AOR: 2.03 95% CI: 1.07, 3.82) were statistically associated with completion of continuum of maternal healthcare. Similarily, having a partner with primary education (AOR: 3.73, 95% CI: 1.65, 8.42), a governmental employeed a partner (AOR: 5.33, 95% CI: 1.03, 27.53), a small family size (AOR: 6.40, 95% CI: 2.48, 16.51), grand multiparity (AOR: 0.18, 95% CI: 0.07, 0.44), receiving complete service during service contacts (AOR: 3.08, 95% CI: 1.75, 5.40), advice during the service contacts (AOR: 4.67, 95% CI: 1.10, 19.92), and having social support (AOR: 2.05, 95% CI: 1.18, 3.56) were statistically associated with adverse birth outcomes. Moreover, the qualitative findings revealed that triadic factors: health system, community, and individual-level factors influence the continuation of maternal healthcare.

Conclusions and Recommendations: This study revealed that less than one in five women who began ANC completed the continuum of care, and one in fourteen births had adverse outcomes. The predictors for care completion were women's residence, occupation, their partners' education, delivery complications, parity, time of ANC booking, received services, and knowledge about ANC and PNC. Educated women, formally employed partners, who received a full service packages, had smaller families, and social support were more likely to have favorable birth outcomes. These parameters necessitate interventions from care providers, the community, and the health system. To enhance maternal healthcare, it is recommended to address the shortfalls in supplies and infrastructure, strengthen health facilities' capacity to provide comprehensive and quality care during contacts. It is crucial to resolve barriers faced by both providers and clients, create a supportive environment for providers, and provide relevant information. Equal importance should be given to all aspects of maternal healthcare. Furthermore, larger-scale research that considers both maternal and newborn outcomes, as well as the longer-term effects of completing the continuum of care on these outcomes, is recommended.

Keywords: *Paradox, birth outcomes, maternal healthcare, continuum of care, completion, Ethiopia*

Table of contents

List of tables

List of figures

Acronyms and abbreviations

ANC	Antenatal care
ABOs	Adverse Birth Outcomes
AOR	Adjusted Odds Ratio
CoC	Continuum of care
COVID_19	Coronavirus Disease 19
EDHS	Ethiopia Demographic Health Survey
HCPs	Health care providers
HEWs	Health Extension Works
ID	Institutional Delivery
IDI	In-depth interviews
IHRPGD	Institute of Health Research and Postgraduate Director
JZHO	Jimma Zone Health Office
KOFIH	Korea Foundation for International Healthcare
LBW	Low birth weight
MHC	Maternal healthcare
MLICs	Middle and Low Income Countries
PCA	Principal Components Analysis
PCMC	Person-Centered Maternity Care
PHCU	Primary Health Care Unit
PNC	Postnatal care
PSM	Propensity Score Matching
SBA	Skilled Birth Attendance
SDGs	Sustainable Development Goals
SPSS	Statistical Package for the Social Sciences
SVD	Spontaneous Vaginal Delivery
TGA	Theory of Goal Attainment
WHO	World Health Organization

Chapter One: Introduction

This section presents background information on maternal healthcare (MHC), the problem statement, the country profile, the healthcare system, and maternal healthcare in Ethiopia.

1.1. Background

Maternal healthcare (MHC) has been a critical component of healthcare since the 1940s, with the goal of decreasing the tragedy of maternal morbidity and mortality (1). The continuum of care (CoC) has been a central principle in MHC since the 1970s, aiming to ensure access to health services (2–4). The concept of CoC is to ensure the right care, by the right person, at the right time and place (5, 6), with the impact established by the preceding service resulting in more lives saved at a lesser cost and having the time and place dimensions (4, 7–9).

Several studies indicate that high-quality maternal and newborn health outcomes across the CoC are associated with better overall outcomes (4, 10, 11). The CoC is thought to be the most effective and important means to improve the survival and well-being of mothers and children under five, reduce the yearly toll of their morbidity and mortality, and contribute to the achievement of global targets (3, 4,7, 8, 12).

Antenatal care (ANC), Institutional Delivery (ID), and Postnatal Care (PNC) are among the critical stages in the maternal and child healthcare continuum. Theoretically, the number of women reaching the PNC stage should be higher than those using ID services, which should be higher than those enrolling in ANC. However, several studies have identified a paradox, where the reality is the reverse of what is ideally expected. For instance, the World Health Organization (WHO), local health authorities, and numerous studies state that the proportion of women giving birth in health facilities and receiving PNC is low compared to ANC attendance, and mothers who attend the recommended ANC contacts fail to use institution delivery and PNC (5, 13, 14).

Despite the progress in improving maternal health, disproportions remain high in low- and middle-income countries (LMICs). For example, in one study, only 14% of women in Sub-

Saharan Africa received all of the recommended MHC services (15). The study's departure is due to this paradox. For example, there is a significant dropout between each level of care, contrasting the idea that using one MHC level correlates with using the next (subsequent) level of care.

In Ethiopia, despite efforts and progress, MHC completion is still low and poorly characterized. According to the Ethiopia Demographic and Health Survey (EDHS) 2016 data, ANC four or more was 32%, institutional delivery was 26%, and PNC was 17% (16). However, it was unclear if the 17% of PNC users were from the 26% of institutional delivery users, and if the 26% of institutional delivery users were from the 32% of four or more ANC users (16). While Ethiopia is among the 68 "Countdown countries "contributing to 90% of global maternal deaths (17).

The EDHS 2019 data, particularly for the Oromia region where the study was conducted, also lacks clear evidence of the association between the utilization of different MHC services. For example, it is not well-reported if the 26.1% PNC utilizers were from the 41% institutional delivery utilizers, or if the 41% institutional delivery utilizers were from the 40.6% of four or more ANC utilizers (18).Hence, the studies included in this dissertation analyzed the current evidence, investigated the barriers to completing MHC, dropped out at each stage, and described the association between completion and birth outcomes.

1.2. Statement of the problem

Pregnancy is generally a pleasant experience for women and their families, but it can also result in anxiety and potentially life-threatening complications (14, 19, 20). To reduce maternal, newborn, and child deaths, the WHO promotes a "continuum of maternal healthcare" framework that emphasizes early detection, prevention, and management of complications throughout pregnancy, childbirth, and postpartum care (3,4,17,21–23). This framework involves care for women before the pregnancy, during pregnancy, childbirth, and postpartum to help them and their babies reach their full health and well-being, potentially through the provision of ANC, skilled birth attendance (SBA), and PNC (1,12,13,24–26).

The CoC framework has become a guiding principle in the delivery of Maternity, Neonatal, and Child Health (MNCH) services. When women of reproductive age utilize this CoC as recommended by the WHO, maternal, neonatal, and infant fatalities could be reduced (2–4). This could be essential in achieving the global targets of ending preventable maternal and under-five mortality (12).

Evidence has demonstrated that the maternal health agenda is shifting from preventing maternal deaths to promoting women's health and wellness (27) and pregnancy is used as a window of opportunity and entry point for them to access continuous healthcare during pre-pregnancy, pregnancy, labor and childbirth, PNC, family planning, other reproductive healthcare, and non-communicable disease (NCD) (28). WHO believes that ANC is a platform for health promotion, screening, diagnosis, and prevention (29). It also provides a chance to communicate with and support women, families, and communities at a critical time in a woman's life, which is key not only to saving lives but also has the potential to improve health outcomes, ultimately leading to a better quality of life (19, 29).

Also, WHO recognized the synergy and complementarity of Maternal Health Care (MHC) in reducing the far-reaching complications that arise throughout pregnancy and childbirth (17). However, in many Low- and Middle-Income Countries (LMICs) including Ethiopia (30) , maternal and neonatal mortality as well as dropout from the CoC completion remain high high (8, 9). This is a significant challenge, despite these being crucial indicators of progress towards the Sustainable Development Goals (SDGs) (31).

In 2020 alone, a staggering number of deaths occurred: 287,000 mothers, equating to 800 deaths daily, 2.6 million newborns (stillbirths), and 9 million children, with a disproportionate 98% concentrated in low- and middle-income countries (LMICs). In addition, millions of women are also suffering from pregnancy-related complications, including infertility, fistulas, and incontinence (3, 19, 20). This alarming situation jeopardizes achieving SDG targets by 2030 (32, 33), particularly for stillbirth reduction (target: 12 or fewer per 1,000 births) (33, 34). LMICs in regions like southern Asia and

Sub-Saharan Africa have experienced slow declines over the past 15 years, and the projected rate of stillbirth ranges from 21.3 to 56.9 per 1,000 births (34–36).

Mounting evidence indicates that preceding care has a direct effect on subsequent care in the MHC continuum (3, 22, 23). For instance, systematic reviews and meta-analyses have shown that having the recommended number of ANC increases the likelihood of health facility delivery and PNC utilization (1,3,37–39).

However, studies conducted in various parts of the world found that there is a huge disparity in the completion of the continuum of care in LMICs, including Ethiopia.

For example, at the time when this study started, the annual number of first ANC visitors and institutional deliveries was approximately 4:1 (30, 31). The proportion of the continuum of maternal care completeion is 5% in Cambodia (41) ,10% in Tanzania (13), 8.0% in Ghana (42) ; and 50.4% in Egypt (43).

Furthermore, studies conducted in various regions of Ethiopia also yielded varying results; for instance, 9.7% in Arbaminch Zuria woredas (12), 12.1% in the West Gojam Zone of the Amhara region (44), 9.1% and 6.56% data from the Ethiopia Demographic and Health Survey (EDHS) 2016 (6,45), 47% in Motta town and Hulet Eji Enese district, Northwest (46), 45% in Enemay district, Northwest (2), 21.6% in Gondar Zuria and Dabat districts, Northwest (47), and 37.2% in Debre Berhan Town, Amhara (48).

Also, the proportion of mothers who used ANC, ID, and PNC also varies from country to country; for example, in Nigeria, 60.6% received ANC, but 38.1% of those who received ANC did not use SBA, and 50.8% of those who had skilled delivery failed to attend the postnatal visits (49) ; in Tanzania, 96.5% received ANC at least once, 65% gave birth at a health facility, and only 22.5% attended PNC (13) ; however, in Egypt, 90% had ANC4 plus visits; 85% used SBA; and 53.2% had PNC (43).

A study analyzing Demographic and Health Surveys from nine countries - Bangladesh, Nepal, Pakistan, Ethiopia, Malawi, Rwanda, Senegal, Tanzania, and Uganda to examine the maternal healthcare continuum in South Asia and Sub-Saharan Africa revealed a substantial dropout rate of over 50% in the continuum of care, primarily occurring between the first ANC contact and the four or more ANC contacts (50).

Implementing low-cost interventions, including high-quality MHC, could have a positive effect on adverse birth outcomes (12, 51). ANC is used for early detection, management, and prevention of pregnancy complications, ensuring a healthy newborn (23).

However, different studies reported different results on the effects of the time of ANC intake, the contents of the service, and the frequency of contact on maternal and child health (52–54). For instance, further analysis from 18 LMIC Demographic Health Surveys (DHS) indicates that having four or more ANC consultations and the timing of these consultations decreased the odds of LBW (55). A cohort study and meta-analysis found that receiving care from antenatal to postnatal care reduces the risk of birth-related complications by 15% (56, 57), but gestational age at first ANC contact does not affect on stillbirths in isolation (57). Another systematic review and meta-analysis showed that a continuum of care during pre-pregnancy and pregnancy periods may lower the incidence of newborn neonatal and perinatal mortality risks by 21% and 16%, respectively (58). A study also found that completion of the continuum of care can lower infant mortality by 36 to 67% (59).

A systematic review and meta-analysis in Ethiopia reported that the overall pooled prevalence of adverse fetal outcomes in Ethiopia was 26.88% (60). A few earlier studies in Ethiopia revealed various prevalences of unfavorable birth outcomes. For instance, a study from North Wollo, Northeast Ethiopia, reported 31.8% (61). The study from Gondar University Hospital in Northwest Ethiopia reported a rate of 23% (62), while the one from Hawassa Town Governmental Health Institutions in South Ethiopia reported a rate of 18.3% (63) and ANC follow-up, history of adverse birth outcomes (ABOs) and residency, ANC follow-up, pregnancy-induced hypertension, maternal age, chronic disease(s), pregnancy complications, previous history of ABO, presence of a cat in the house, knowledge of preconception care, and twin pregnancy were predictors (24, 35, 36, 38, 39, 64).

Over the past three decades, reducing maternal, newborn, and child mortality and morbidity has been a top priority, and various strategies have been implemented at both

the community and facility levels in Ethiopia (30). These strategies align with WHO recommendations and encompass capacity building for healthcare workers, expanding healthcare facilities, strengthening health system governance, and addressing human resource limitations. Additionally, initiatives like birth preparedness programs, tackling cultural practices that hinder access to care, health extension work, social network support, pregnant women's forums, maternity waiting homes, subsidized or exempted maternal and child healthcare, and ambulance services will ensure access to skilled birth attendants (1, 17, 37, 65).

Despite all these efforts, the completion of MHC remains low. For example, according to the EDHS 2019, 47.5% of women gave birth at health facilities, but only 34% had PNC within the first two days. It's also worth noting that the country uses a non-standard definition of SBA, and so 5.8% of the work of SBAs is performed by Health Extension Works (HEWs) (18, 66, 67). Theoretically, the prior experience determines the subsequent MHC utilization (68), and what could be anticipated was (the number of postpartum women who should **PNC**) ≥ (the number of women who give birth in **ID**) ≥ (and the number of pregnant women who started **ANC**). However, as described above, in reality, the situation is the reverse (50). Hence, this study aimed to provide evidence that may be used to support health policy decisions and the development of initiatives to improve completion and the effect of completion on birth outcomes, which contributes to the achievement of the Sustainable Development Goals (SDGs).

1.3. Country Profile

Ethiopia is a country in the eastern part of Africa with a total population of more than 120 million. It is the second most populous nation among African countries and ranks 12th in the world (69). It is bordered in the northeast by Eritrea and Djibouti, in the east and southeast by Somalia, in the southwest by Kenya and South Sudan, and in the west and northwest by Sudan. It is a country home to various ethnicities, with more than 80 different spoken languages, rich culture, topography, and agroecology diversities, and is divided administratively into eleven regional states: Oromia, Amhara, Tigray, Afar, Beneshangul-

Gumuz, Gambella, Harari, Sidama, Southwest Ethiopia Peoples' Region (SWEPR), South Ethiopia Region, Central Ethiopia, and Somalia, as well as two chartered cities: Addis Ababa and Dire Dawa. There are districts in regional states and city governments. These districts are subdivided further into kebeles, the smallest administrative units (69–72). It is one of the countries experiencing a high total fertility rate (TFR) with an annual population growth rate of 2.6% , commensurate with low MHC use (73–75) and markedly high maternal mortality (5,30).

1.4. Healthcare System and Maternal Healthcare in Ethiopia

The modern health care service in Ethiopia was introduced at the end of the 19th century and the beginning of the 20th century. In 1948, the Ministry of Health (MOH) was founded. Then, a number of hospitals and health sciences training institutions were opened. Prior to 1991, however, the health system was centralized, and services were mainly concentrated in major urban areas (76).

Since 1993, Ethiopia has prioritized improving healthcare access through a series of national plans. Following a new health policy emphasizing quality primary care for all, the country implemented four successive Health Sector Development Plans (HSDPs) and is currently on its Health Sector Transformation Plan (HSTP)(77). Currently, the health system is structured with a three-tier system: primary, secondary, and tertiary levels of care. The primary level of care includes primary hospitals, health centers, and health posts, whereas general hospitals are included in secondary and specialized hospitals in tertiary(76). A health center and five health posts make up the primary health care unit (PHCU). The PHCU provides preventive and curative services to about 25,000 people. A primary hospital provides inpatient and ambulatory services to 60,000 to 100,000 people and emergency surgical services. The general hospital, provides inpatient and ambulatory services to 1.0 to 1.5 million people and serves as a referral center for primary hospitals. Tertiary-level, a specialized hospital provides services to 3.5 to 5 million people and serves as a referral center for general hospitals (78,79).

Primary care is a vital building block of many effective health systems (80), and over the last two decades, the country has successfully implemented its strategy of expanding and rehabilitating primary healthcare facilities to ensure that every Ethiopian is reached with essential and quality services (77).

Since the establishment of MoH in 1948, maternal health has been among the major health service program areas (76). Currently, the ministry is implementing the recommended services that are being delivered through the three-tier health system, with due emphasis on the continuum of care delivery approach with the major strategic initiatives of providing comprehensive, quality, and equitable MHC (69).

Chapter Two: Aim, Research Questions, Hypotheses, and Framework

This chapter presents the key aims, research questions, hypotheses, and objectives of the study on the continuum of maternal healthcare, along with the theoretical framework guiding the study.

2.1. The overall aim of the study

The overarching goal of this Ph.D. study was to generate evidence on maternal healthcare in the context of primary healthcare in relation to the continuum of care in the Ethiopian context. Moreover, in this dissertation, we reviewed evidence on maternal healthcare in low- and middle-income countries, investigated reasons why women drop out of MHC, identified barriers to MHC continuum completion, and identified the association between completion of the MHC continuum and birth outcomes. More particularly, the studies included in this dissertation addressed the following research questions and specific objectives associated with the study hypothesis:

2.2. Hypotheses

The hypotheses for this research were

① There is no difference in the proportion of women who started ANC, who gave birth in a health facility, and who used PNC.

① Women who complete MHC COC are less likely to experience adverse birth outcomes than those who do not.

2.3. Research questions

① What is the available evidence on the maternal healthcare continuum in middle and low-income countries?

① What is the proportion of women who have completed the maternal healthcare continuum in Jimma Zone?

① What factors hinder or promote women's completion of the maternal healthcare continuum?

① What is the relationship between the completion of the maternal healthcare continuum and birth outcomes?

2.4. Specific objectives of the study

① To examine and describing all available evidence on MHC in Low- and LMICs : A scoping review

① To investigate level completion for MHC continuum: Barriers and Facilitators of MHC continuum completion among pregnant women in Jimma Zone, Southwest Ethiopia

① To explore why do women walk away from MHC in southwest Ethiopia

① To assess effect of the continuum of MHC completion on birth outcomes.

2.5. Conceptual framework

The conceptual framework for this study was developed based on King's Theory of Goal Attainment (TGA) (81), Andersen's behavioral model for health service use (82), and findings from the scoping and subsequent literature review that identified completion of the continuum of MHC is influenced by individual, family, community, and facility-level variables. Hence, because of the multiplicity of factors that can affect MHC, the King's TGA and the behavioral model for health care were used to structure and organize the conceptual framework, background of the study, formulate the research tools, and frame the discussion.

The King's TGA emphasizes nursing as a dynamic process involving action, reaction, and interaction between nurses and clients. It has been used as the basis for practice, education, research, and administration. In this study, it was used to frame the conceptual framework related to the barriers to the utilization and completion of MHC. These barriers could originate from the interaction between care providers and clients. For instance, the way of communication and interaction between care providers and clients is at the heart of the care that leads to transactions and goal attainment (outcomes). Conversely, health care may be rejected and may not be completed for MHC if there is incongruence between the providers and the clients.

Anderson's behavioral model for health service utilization provides a conceptual structure to understand access to and utilization of health services and to recognize the factors that impact a person's decision to use or not use existing health services. It was used as the theoretical background for the literature review, categorization, and organization of the variables that facilitate or impede an individual's access to healthcare services. These variables are determined by contextual characteristics, individual characteristics, health behaviors, and outcomes. It was also used to enrich our understanding of the barriers to MHC utilization, provide a guide for structuring both the quantitative and qualitative tools, and make complex data processing easily and logical **(Fig1)**

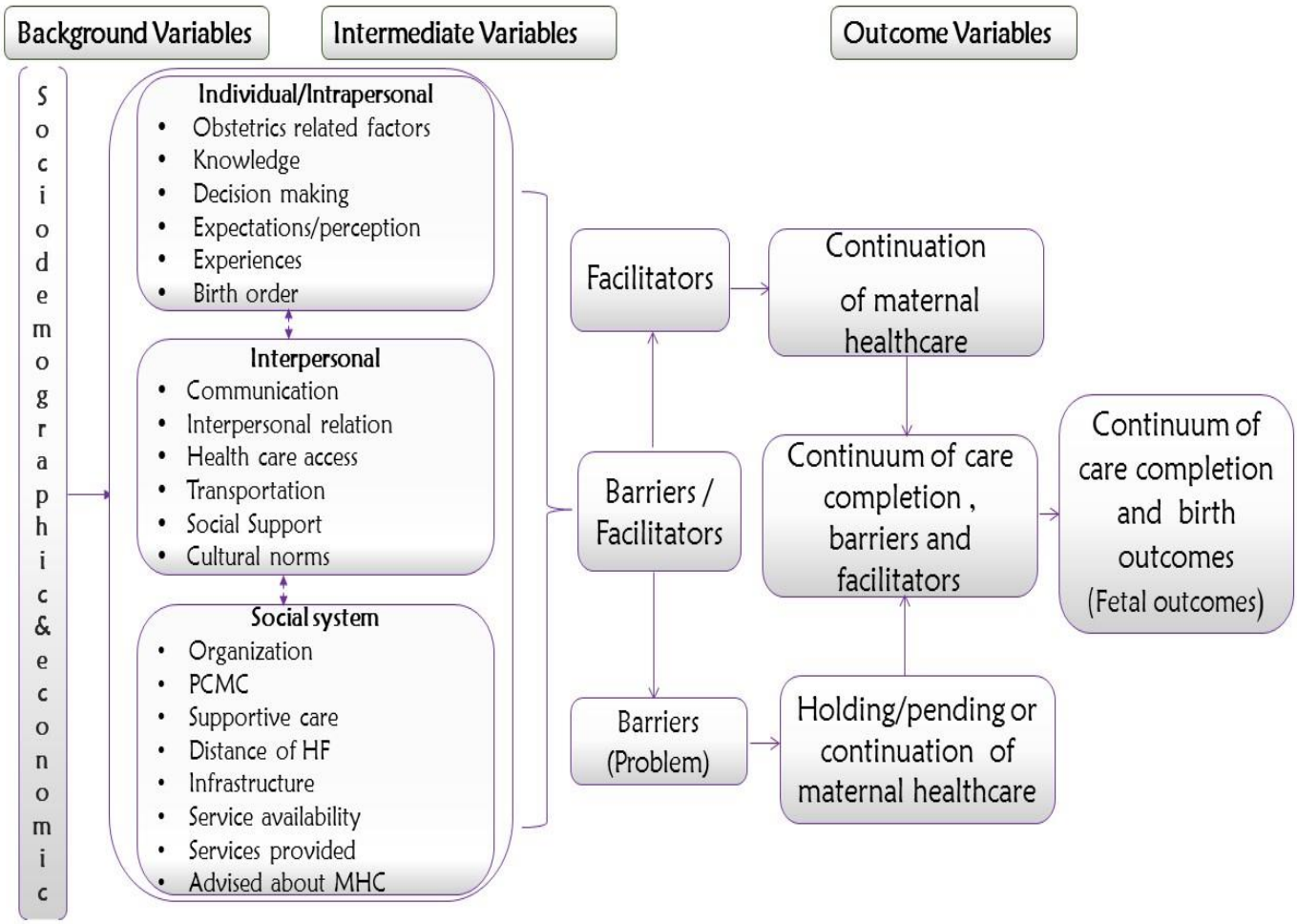

Figure 1: Conceptual framework, adapted guided by Andersen's behavioral model for health service use(81),and the King's TGA (82), 2019

Chapter Three: Methods and Materials

3.1. Study design

Compared to a study that is based on a single methodological approach, a combination of methodologies might contribute to a better understanding of a research problem, though using a multi-method approach has its own flaws (83). In this study, we employed a Critical Realism Philosophical orientation with a multi-method research design (scoping review, qualitative, and quantitative) to gain rich insights. Scholars argued that a scoping review is an ideal tool to figure out the types of evidence that are available on a particular topic, map existing evidence, refine key concepts, examine research methods used, identify important characteristics of the concept, and analyze knowledge gaps, and be used as a jumping off point for a systematic review. Even though it can't offer concrete guidance from a clinical or policy-making point of view (84), it was selected over the other review approaches with their methodological limitations to examine and describe all available evidence on the continuum of MHC in LMICs to learn the nature, scope, extent, sources, and types of evidence and literature available and their recommendations.

In addition, one of the objectives of this study was to see the effect of the completion of the MHC continuum on birth outcomes. However, the use of cohorts is sometimes mandatory because a randomized control study may be unethical. For instance, in this study, we cannot deliberately keep mothers from care utilization; we can only study the effect of care utilization among those who .have already been exposed. Hence, we selected the cohort (follow-up) study to examine the completion of the continuum of MHC, the barriers and facilitators for its completion, and the effect of the completion on birth outcomes.

Although gaps in care can be seen as inevitable and natural, the way health managers, care providers, and women go about closing these gaps can be highlighted for wider application. A qualitative method was used to explore and gain insights about the context in which the continuum of MHC takes place, the barriers that explain why women walk away from it, and what health managers, care providers, and women think about it.

3.2. The study setting and period

The study took place from July 2020 to June 2021 in two districts, Dedo and Omo Nada, of the Jimma Zone.The zone is one of the zones that comprise the Oromia Regional State, situated 350km southwest of Addis Ababa, and encompasses 21 districts and two town administrations. With a population of 3.5 million, nearly half (49.9%) are women, of which 23.1% are of reproductive age. There are 562 Kebeles, one tertiary hospital, three general hospitals, five primary hospitals, 122 health centers, 512 health posts, 3327 health professionals, and 1136 health extension workers in the zone (71, 85).

The zone's elevation ranges from 880 to 2600 meters above sea level, with the lowest (Gibe Valley) and the highest (Denbel Forest). The average annual rainfall ranges from 1200 to 2800 mm. The zone comprises 16% high land, 62% temperate land, and 22% lowland. The area's main economic activities are livestock and crop-mixed subsistence farming systems. Coffee, cereal, and fruit production are part of the cropping system, while cattle, sheep, goats, horses, donkeys, and mules are part of the livestock sector (71). Dedo district is among the 21 woredas in Jimma Zone. The district has 36 kebeles (33 rural and three urban kebeles). The total population of the district is 227,592. The district has one primary hospital, eight health centers, and 36 health posts. Also, Omo Nada district is among the 21 districts in the zone. The district has a total of 31 kebeles (rural 27 and 4 urban kebeles). The district has one primary hospital, seven health centers, and 31 health posts (the district's annual reports, 2020) **(Fig.2).**

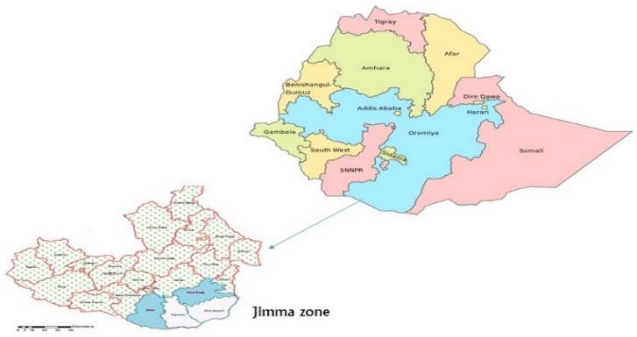

Figure 2: Map of Ethiopia, Oromia Regional State, and Jimma Zone 2020. Source: https://en.wikipedia.org/wiki/Regions_of_Ethiopia#/media/File:Regions_of_Ethiopia_EN.svg and Zonal Health Office.

3.3.Source and study population

The population for the scoping review consisted of all published articles related to MHC. All currently pregnant women in the randomly chosen districts were the source population, and the sampled pregnant women meeting inclusion criteria were the study population for the quantitative, whereas the three target groups: care providers in leadership positions at district health departments and care providers who have been providing maternal health services were purposefully picked as key informants and women attending the MCH clinic were purposefully picked for indepth interview.

3.4. Inclusion and Exclusion Criteria

Published articles, pregnant women, and key informants who met the established criteria were considered for the study.

3.5. Sample size and sampling techniques

A three-step search strategy was used for the scoping review. A total of 1259 articles were identified. To determine the required sample size for the quantitative study, we used Epi-Info V. 7.2.4.0 statCalc, assuming an alpha of 0.05 (95% CI), a power of 0.8, a ratio of unexposed (incomplete CoC) to exposed (completed CoC) groups of 23.44, a probability of event (birth outcomes) in the non-exposed group at 25.78%, and a probability of event (birth outcomes) in the exposed group at 1.1% (13) with a design effect of two. Finally, a 10% buffer was taken into account for non-responses and follow-up losses, bringing the final sample size to 1065 participants.

The cohort of pregnant women was identified using a multistage cluster sampling technique. To begin with, the districts were identified and stratified according to their population. Two districts were randomly selected. Subsequently, the two districts were stratified into semi-urban and rural kebeles. Then, the pregnant women were selected using a simple random sampling method from the kebeles and enrolled in the study. For the qualitative study, criterion-based purposive sampling was used to select the key informants.

3.6. Data collection instruments

For the scoping review, the data were extracted using the template developed for this particular review that aligned with the review objective. For the quantitative study, the tools, which comprise nine sections, were adapted from a range of sources, including the EDHS (16), the Person-Centered Maternity Care tool (86), the WHO guidelines (87), and other various sources (86, 88–92). For the qualitative study, an unstructured key informant in-depth interview guide was used to gain an in-depth understanding of the context in which the continuum of MHC takes place and barriers to existing health service use. Questionnaires and guides were prepared in English, then the questionnaire was translated into 'Afan Oromo' and used to collect the data.

3.7. Data collection procedures and data collectors

For the review, the data were extracted through an iterative process. The general characteristics of the included studies were summarized using the template.

For the quantitative study, data were collected at three- time points. During phase I, a home visit was conducted to enumerate the women and collect data about socio-demographic information, economic status, past MHC experience, knowledge of MHC, and services and advice given at the current pregnancy's first ANC contact. Phase II was at three months post-baseline (fourth ANC contact, gestation 36–38 weeks). Phase III took place 10 weeks after Phase II to assess MHC practices, birth outcomes, women-centered maternity care, decision-making autonomy, and social support (**Fig 3**). For the qualitative study, the data were collected through face-to-face interviews from an insider perspective using third-person questions to enable respondents to talk about issues without personalizing them (93–95).

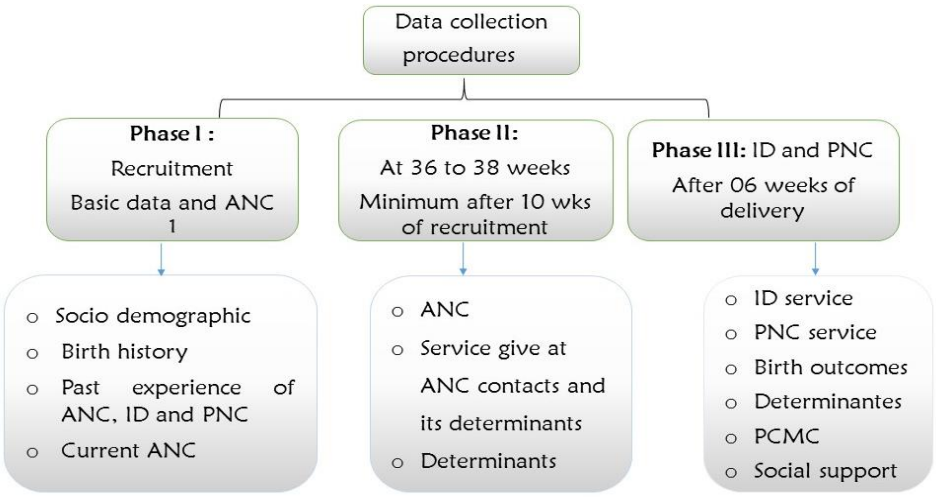

Figure 3: Data collection intervals for the study

3.8. Data quality maintenance

To minimize bias during data collection, data collectors were blinded to the study hypothesis. To ensure data quality, the data collectors underwent training on the study's objectives and data collection procedure. For the qualitative study, data collectors who were familiar with the local context and had experience in qualitative data collection were employed.

3.9. Measurements, operational definition, and definition of terms

① **Continuum of Care (CoC) for Maternal Healthcare (MHC):** is continuity of care through pregnancy, childbirth, and after birth as a key strategy in reaching mothers and babies at a crucial time (96). For this study, the dependent variables were the completion status of the continuum of care for MHC and birth outcomes.

① **Continuum of care completion**: The completion status was categorized as "complete" when a woman had at least four ANC appointments, assistance from a SBA (doctors, midwives, health officers, or nurses in health facilities), and at least one PNC visit after discharge or home delivery (41).

① **Birth outcomes** : The status of the birth outcome was measured in terms of adverse birth outcome, which is a condition that pregnant women wouldn't want to

experience, and its indices are stillbirth, preterm birth, low birth weight, small for gestational age, macrosomia, neonatal death, and congenital anomalies (53, 54). However, in this study, it was measured in terms of stillbirth, preterm birth, low birth weight, and neonatal death. It was categorized as "absent (favorable birth outcome)" when it was free of preterm birth, stillbirth, LBW, and neonatal death; otherwise, it was categorized as "present" (unfavorable birth outcome).

① **Parity:** is defined as the number of times that she has given birth to a fetus with a gestational age of 28 weeks or more, regardless of whether the child was born alive or was stillborn. Recomputed as Multiparity (≤4) and Grand multiparity (≥ 5)(97)

① **Birth to pregnancy Interval:** is the amount of time that passes between giving birth and getting pregnant again. Recomputed as a short interval (2 or fewer years) and an optimum interval (above 2 years) (98)

① **Social support:** is having friends and other people, including family, to turn to in times of need or crisis to give you a broader focus and a positive self-image. The composite index was computed by adding the 10 responses. If the computed value is 10 (yes for all 10 items), one has social support; otherwise, one does not.

① **Person Centered Maternity Care (PCMC):** The scale includes 27 items that span four domains: dignity and respect, communication and autonomy, supportive care, and organization. The composite index was computed by adding the 27 items that span these domains. If the computed value is 27 (Yes for all 27 items), one has PCMC; otherwise, one does not.

① **Paradox:** two things seem to be opposite to each other, and two things seemingly contradictory or opposed to common sense or acceptable premises [Incongruity] (**Merriam-Webster dictionary**). It is measured in terms of the presence or absence of things seemingly contradictory or opposed to actual practice and what is expected.

3.10. Data management and analysis

For the review, the general characteristics of the included studies were summarized, and a descriptive analysis was performed. A checklist for reporting scoping reviews was used to present the results. For the quantitative analysis, SPSS and Stata were utilized. A descriptive

analysis was conducted to summarize the variables by computing proportions and statistics.Principal Component Analysis (PCA) was used to compute the wealth index. A bivariate analysis was employed to examine the relationships between the dependent and independent variables and the selection of candidate variables for multivariate logistic regression. Propensity Score Matching (PSM) was fitted to estimate the effect of a continuum of care completion on birth outcome. Variables with p-values less than 0.25 were included as candidate variables for the final model (99). A p-value less than 0.05 and an adjusted odds ratio with a 95% confidence interval were considered to declare statistical significance. The analysis of the qualitative data was conducted thematically, and elucidations of the results following the respective themes and verbatim that capture dominant views were taken into consideration.

3.11. Ethical considerations

Ethical approval was obtained from Jimma University, Health Institute, Institutional Review Board (IRB) Ref.No. IHRPGD/433/2019 (27th November 2019). Administrative clearance was obtained from the zone and selected woredas health office. To ensure participants were fully informed the information sheets addressing the objectives of the study, and the benefits and harms were given to the study participants. Before the data was collected, written informed consent was obtained. Participation in the study was entirely voluntary.

Chapter Four: Article I

Maternal Healthcare in Low- and Middle-Income Countries: A Scoping Review

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Abstract

Background: The continuity of maternal healthcare is a crucial framework that aims to save lives and promote the well-being of mothers and newborns. Despite its importance, the status of this continuum remains insufficiently studied.

Objective: This review is to examine and describe available evidence on the status of maternal healthcare in low- and middle-income countries.

Methods: We conducted a scoping review and searched for pertinent studies in the PubMed and Cochrane Library databases. In addition, we carried out lateral searching using Google Scholar, the reference lists of the studies we included, and a grey literature search. The full list was screened by one reviewer, then randomly divided into two parts, each independently screened by another reviewer. These two reviewers independently extracted the data, and any discrepancies were resolved through discussion.

Results: We identified a total of 1259 records. Among these, 13 studies were included in the review, published between 2015 and 2019. More than half (53.8%) of the included studies originated from African countries. Regarding the data source, 53.8% were derived from countries' demographic health surveys, and all were designed as cross-sectional studies. The overall trend indicates a decline in service usage as women progress along the continuum of care from pregnancy to childbirth and postnatal care, with the most significant gap observed between institutional delivery and postnatal care. Completion rates varied across countries, with a 60% rate in Cambodia during the 2010 CDHS and a 5% rate in Ratanakiri, Cambodia, in 2015.

Conclusion and Recommendations: The status of the continuum of care for maternal healthcare varies across countries. There are limited studies on the continuum of maternal healthcare, and more than half of the studies in this area were from countries' demographic health surveys, and all of them were cross-sectional in design. Furthermore, none of the reviewed studies considered the status of the continuum of care in terms of birth outcomes. Hence, it is crucial to estimate the status of the completion of the continuum of care and its effect on birth outcomes in countries like Ethiopia, where the burden of maternal and newborn mortality is high.

Key words: *maternal, newborn, child health, continuum of care, completion, LMIC*

Introduction

The continuum of care [CoC] for maternal health care [MHC] is the continuity of individual care that has been considered as a core principle and framework to underpin strategies and programs aimed at saving the lives of mothers and babies, and promoting overall health (1). The assumption behind the concept of CoC for MHC is that the health and well-being of women, newborns and children are closely intertwined and should be managed in an integrated approach. The CoC model demands ensuring availability and access to essential health services for women and childhood interventions, with the purpose of ensuring the needs of each group are included in policies and programs (1–3).

The CoC for MHC has two dimensions: time and place. The time dimension refers to the lifecycle care that is given during adolescence, pregnancy, childbirth, the postnatal period, and childhood. This care is linked to the place dimension, which includes the household, community, and health facilities. The effect at each time period depends on the foundation set in the preceding time period. Ensuring more comprehensive healthcare for each woman at each level results in saving more lives at less cost in a more integrated and efficient way (4). The CoC recognizes the relationship between MHC at different time periods and places. An effective CoC for MHC is a means to reduce the burden of maternal, neonatal, and child death, and improve their health, well-being, and survival (2,3).

Evidence demonstrates that the lack of appropriate care at all levels has been associated with poor maternal and newborn health outcomes (1,5,6). Despite progress in improving reproductive, maternal, and neonatal and child health, disproportions remain high in Low and Middle-Income Countries (LMICs). For example, only 14% of women in Sub-Saharan Africa received all services: at least one Antenatal Care (ANC), four or more ANC, delivery with a Skilled Birth Attendant (SBA), Postnatal Care (PNC) check within 24 hours, and family planning counseling within one year of birth (7).

Findings from Tanzania indicated that only 10% of women followed the recommended continuum MHC: four ANC contacts, skilled attendance at delivery and at least one postnatal visit (8) . Evidence from Ghana indicated that 86.1% of women had ANC4

plus while 75.6% gave birth at a health facility; this drastically fell to 25.4% for PNC within 48 hours and only 8.0% had completed the continuum of care (9). Similarly, the trend in the CoC for maternal and newborn health in South Asia shows a decline in the use of services as women move along the continuum of care from pregnancy to childbirth and postnatal care, and only one-fourth of women received all the services provided during pregnancy, delivery , and postpartum (7,10).

A study in Cambodia indicated that 90% of women received ANC, while 19% dropped on the pathway, 71% continued for skilled birth, and only 60% went for the full range of services (11). In Pakistan, the completion rate has increased from 15% in 2006 to 27% in 2012 (12), and in Nepal, only 27% of women used all three components of MHC (13).

In Ethiopia, 32% of women had ANC 4 plus, despite a higher proportion of them having gone for their first ANC (62%), suggesting a low completion rate. Only 26% used institutional delivery, and 17% of women and 13% of newborns received PNC within the first 2 days of birth (14). Also, according to the 2019 Mini Demographic and Health Survey, the ANC 4 plus was 43%, while births attended in a health facility was 48 %, but PNC within the first 2 days of birth was 34% (15). Even though it is assumed that utilization of one level of MHC is related to the subsequent (next) level of care usage, there is a high dropout rate between each care level. However, in LMICs, MHC utilization is still low in relation to the effort taken, and the completion of CoC status is not well documented. For instance, it is unclear whether in Ethiopia the 17% of PNC users were from the 26% institutional delivery users or the 26% institutional delivery users were from the 32% four or more ANC users.

Therefore, conducting an analysis in this area is vital to generate strong evidence by examining the existing evidence, identifying gaps and, the types of existing evidence in the area to forward logical questions, and call for the use of different research approaches that will be used to address gaps more effectively. Hence, the objective of this scoping review was to examine the status of the continuum of care for MHC and existing recommendations in the LMICs.

Methods

A scoping review is an ideal tool to determine the scope or coverage of a body of literature on a particular area and give a clear indication of the volume of literature and studies available , as well as an overview (broad or detailed) of its focus (16).Thus, this review aimed to provide an overview of the nature, scope, extent, sources, and types of evidence and literature available on status on the continuum of care for MHC using the established scoping review methodology, and map the key concepts.

Objective

The objective of this review is to examine and describe available evidence on the status of the continuum of care for MHC, and existing evidence in LMICs.

Participants/ Population

In this review, the participants/clients were women who are candidates for MHC services [ANC, Institutional delivery and PNC] use as per the World Health Organization [WHO] recommendation.

Concept

The main concept for this review was the completion of the continuum of care for MHC use as per the WHO recommendation. The concept of this review is directed towards women's desire to use the MHC as per the standard, which in turn can be used as a framework to underpin strategies and programs that save lives, promote well-being, improve health and survival, and reduce maternal, newborn, and child death

Context

The context for this review was LMICs to widen the study coverage and generate strong evidence as their health care practices are almost similar.

Inclusion and Exclusion criteria

Any systematic review and primary studies evaluating the continuum of care for MHC in LMICs, irrespective of their study design, reported in the English language published between 1 January 2000 and September 2019, given that the issue of MDG started in 2000 were considered for inclusion **(Figure 4)**

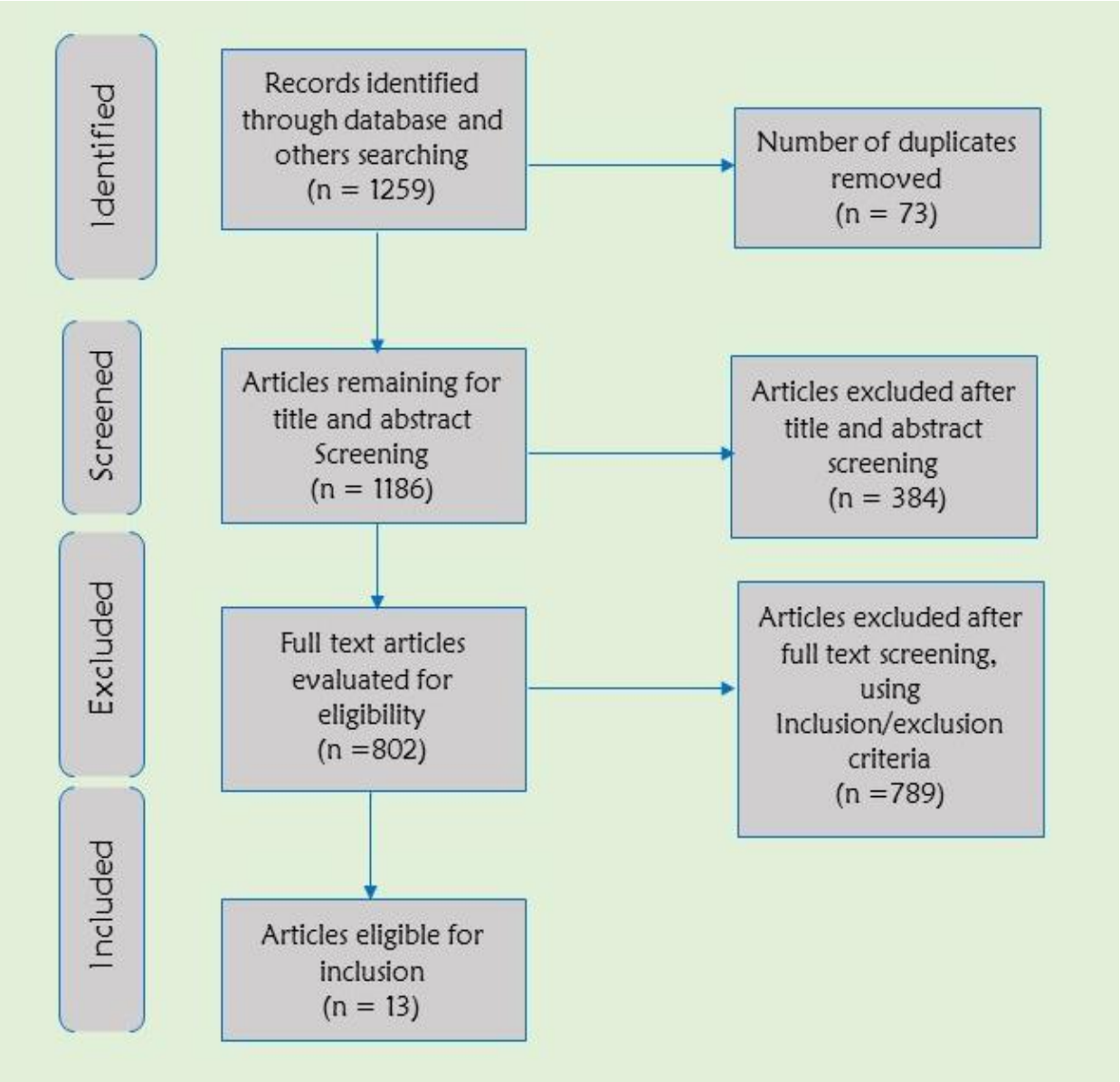

Figure 4: Diagrammatic presentation of the procedure for selecting studies included in the study of MHC in Low- and Middle-Income Countries.

Search strategy

A three-step search strategy was used. An initial search of MEDLINE (via PubMed) and Cochrane Library databases for relevant articles was followed by an analysis of text words contained in the title and abstract and index terms used to describe the article. Then, a second search was made using all the identified keywords: index terms, truncation, Boolean operators, and MeSH (Medical Subject Headings) terms for MEDLINE across all databases included.

Thirdly, the reference list of all the studies, reports and articles was searched for additional studies. Three databases PubMed, Cochrane library, Google scholar and Google were used for searching to identify all the related articles and reports in LMICs. Titles and abstracts were examined for the following search terms" Patient Dropouts", "Continuity of Patient Care", "Maternal Health Services", "Prenatal Care", "Parturition" "Postnatal Care" and "Developing Countries". The retrieved studies were exported into the reference manager and duplicates were subsequently removed.

The search strategy identified; a total of 1259 articles from the three identified databases. After duplicates were removed, 1186 records were left. Titles and abstracts were examined based on pre-determined criteria, and 802 articles were shortlisted for full text review. A total of 802 full-text articles were screened independently by two reviewers based on inclusion criteria; eventually, 13 study articles were included in the final review.

Data extraction and analysis

The general characteristics of the included studies were summarized using the developed template, and the themes in the articles that were aligned with the review objective. The template contained categories for descriptive characteristics of the included studies, like author(s), journal, year of publication, type of study, study design, country of origin, rationale of the study, study population, sample size, outcomes of the study, key findings related to the review, limitations, and recommendations. This iterative process involved reading, annotating, highlighting, and evaluating the literature in the included studies **(Table 1)**

Results

Descriptions of the studies

The review included studies from all regions in LMICs. During the search process, 1259 articles with unique citations were identified. Finally, based on inclusion criteria, 13 articles were retained for final review. The primary aim of this scoping review was to collate all the available evidence on the current status of the continuum of care for maternal health care in LMICs. Also, it thoroughly identified and summarized the existing literature and characterized the evidence using the template developed for this purpose, such as: categories of available literature, their study designs, country of origin, outcomes, key findings, limitations, and recommendations to organize the themes in the literature that were aligned with the reviewing objective and to indicate the gaps that need to be the forthcoming researcher's focus (**table 1**), and the results were summarized under their themes as given below.

Descriptions of the included articles

As to the year of publication of the included articles (studies), it was between 2015 and 2019. More than half (53.8 %) of them were from African countries and further analysis from countries' Demographic Health Survey [DHS]. All of the studies were quantitative in type and cross-sectional study in design

Service utilization level

The proportion of women who received antenatal care, delivered by skilled birth attendants or institutional delivery, and postnatal care differed across the countries. The general trend shows a decline in the use of services as women move along the continuum of care from pregnancy to childbirth and postnatal care, and the highest gap was felt between institutional delivery and postnatal utilization.

The completion status was paradoxical and varied from country to country. For instance, 60% in Cambodia during the 2010 CDHS and 5% in Ratanakiri, Cambodia, in 2015. However, none of the included studies considered the completion status of the three maternal healthcare utilizations and birth outcomes.

Limitations of the included studies

The reported limitations of the included studies differed from article to article and includes: the use of secondary data, maternal complications that could affect the use of maternal care are not included, the precision of information on the content of MHC [subject to women's misreport] and 48 hours after delivery used as the cutoff point [operationalization of variables] (78). Others highlighted that as CoC services were measured based on women's recall response, data on the location of respondents (rural/urban) and distance to a health facility, the reasons for dropout between delivery and the sixth-week PNC were not ascertained (51, 123).

As more than half of the studies were from the DHS data of the countries, the lack of uniformity in variables, study designs, self-reports, absence of information on the quality of care in the DHS data, the time-lag between use of services and date of the survey may lead to recall bias, selection bias,, social desirability, who died due to childbirth-related complications were excluded, sample size, study population, and not detecting causal relationship amongst reported limitations (36, 108, 57, 62, 16, 21, 46, 8, 78, 10) (**Tab 1).**

Recommendations of the included studies

Some of the included studies showed their recommendation explicitly, while it was lacking in the other studies. The informed recommendations were: further studies that take into account the missed variables like community and facility-level factors, working on quality of ANC, early booking for ANC, male involvement, utilization, and birth outcome; other study designs like cluster randomized trials and longitudinal, systematic reviews; conducting the study in a non-project setting; a qualitative study that is relevant to social, cultural, and economic factors; integration of the strategies; strengthening the health systems; and community mobilization in general (**Table 1**).

Table1: The characteristics of studies included to study maternal healthcare in low- and middle-income countries: a scoping review

Author and year	Study area	Source of the data	Study design	Sample size		Findings related to the review %			Recommendations of the study	Limitations of the study
						Any or ANC4+	ANC4+ & SBA	ANC4+, SBA &PNC /CoC		
Wang & Hong. 2015(76)	Cambodia	Secondary: CDHS 2010	Cross-sectional	6,472		90	71	60	Quality of ANC connected to SBAs and PNC	Using 48 hours after delivery as the cutoff
Yeji et al. 2015(51)	Ghana	Primary	Cross-sectional	1,500		86	NI	8	Other designs than cross sectional	CoC is measured based on women's recall responses
Akinyemi et al. 2016(123)	Nigeria	Secondary: NDHS 2013	Cross-sectional	20,467		[Any] 60.6	22.5	11.4	Further studies are needed to fully understand why women do not complete the CoC	Reasons for dropout between delivery and the sixth week of PNC; data not collected in NDHS
Iqbal et al.2017(36)	Pakistan	Secondary: PDHS	CB cross sectional	5,724 for 2006/7		28	20	15	No causal relationships displayed because of the nature of the design used.	Lacking uniformity in variables, the information is based on self-reports and may be biased.
				7,461 for 2012/13		38	32	27		
Singh et al.2017(108)	The nine MCH priority countries for USAID		Cross-sectional	18,036	Nine countries	37.9	28.3	16.9	Better future studies focus on which geographic or administrative areas need the most attention.	It was not possible to study the quality of services. Study designs were subject to recall bias.
					S. Asian	38.8	29.2	24.5		
					SSA	37.5	28.0	13.9		
Mohan et al .2017(57)	Tanzania	Primary	Cross-sectional	1931		66.5	65	10.3	Status of the CoC for MNCH services in non-project setting	Not account for content delivered or quality of content delivered and design
Tamang TM.2017(62)	Nepal	Secondary: NMICS 2014	Cross sectional	2,048		NI	53.1	45.7	In-depth exploration of barriers and perceptions	
Hamed, et al.2018(16)	Egypt	Primary	Cross-sectional	2790		90	85	50.4	The information is based on self-reports	The study populations are rural women.
Kikuchi et al.2018(21)	Cambodia	Primary	Cross-sectional	377		32.6	19.1	5	Interventions or longitudinal studies	Selection bias, recall bias
Amanu et al. 2018(46)	Ethiopian	Primary	CB cross sectional	1281		39.9	31.1	12.1	Improving the early initiation and quality of ANC	Prone to recall bias as the data collected retrospectively
Chaka, et al. 2019(8)	Ethiopia	Secondary: EDHS 2016	CB cross sectional	1342		31.8	NI	9.1	Tracking the progress and factors that influence completion of the CoC	Whoever died due to childbirth related complications were not included and recall bias
Sakuma et al. 2019(78)	Lao PDR	Primary	CB cross sectional	263		54.4	30.4	6.8	Promotion of early ANC and family [male] involvement	Deceased women were not included, information and recall bias
Eshetu etal, 2019 (10)	Ethiopia	Secondary: AMHDS	CB cross sectional	438		25.2	18.5	9.7	Early booking during the antenatal period	Social desirability bias, and selection bias, recall bias

Hint: Hint: SBA = skilled birth attendance; Lao PDR: Lao People's Democratic Republic; one of East Asia's poorest; EDHS =Ethiopian Demographic Health Survey, NMICS=Nepal Multiple Indicator Cluster Survey; the nine MCH priority countries for USAID: Bangladesh, Nepal, Pakistan, Ethiopia, Malawi, Rwanda, Senegal, Tanzania, and Uganda. NI=Not indicated CB = Community based and AMHDS=Arba Minch Health and Demographic Surveillance.

Discussion

Antenatal care provides the best window of opportunity to promote maternal and child health service practices. The completion of MHC increases women's chances of a better birth outcome. However, many Ethiopian mothers deliver at home and fail to attend facility delivery and PNC after receiving ANC(17).

This review included 13 articles published between 2015 and 2019. It revealed that more than half of them were from African countries, with further analysis from the countries' Demographic Health Survey [DHS]. All of the studies were quantitative in type and cross-sectional in design. The completion status varied from country to country and ranging from 60% in Cambodia to 5% in Ratanakiri. In Ethiopia, it ranges from 9.1% to 12.1%.

This is congruent with the study conducted in medical and non medical disciplines like engineering , education, and others that reported that quantitative research is the dominant type of method among the methods used in published articles (18). This might be due to the fact that quantitative research is widely used in biomedical sciences, physics, mathematics, astronomy, veterinary medicine, zoology, botany, and many other fields. However, qualitative research is not that old and is limited to studies mainly in psychology, social sciences, and education. The number of journals covering quantitative methods and research is far more extensive compared to those covering qualitative research. Also, the number of researchers committed to quantitative research is far greater than that of those specializing in qualitative research.

This review included current literature and evidence from the DHS of several countries. Despite the strengths of the studies due to the coverage of a large population and inclusion of all regions within the countries, the data did not capture vital information such as the location of the respondents, distance to the health facility, quality of services, or the exact time of service utilization. Moreover, they had the limitations of being descriptive and cross-sectional by design and subject to respondents' recall bias (9,19,20). Owing to all these limitations of the DHS, it was not possible to conclude the status of the CoC for MHC as the DHS data failed to address the above-mentioned points, like the quality of services,

the exact time of service utilization, and women's recall of events, which can be affected by the period of recall as well as the women's situation at the time of the event. It is expected that women are more likely to misreport or misclassify events the earlier the birth occurred. May be the freely availability of the countries DHS data and resource limitations to conduct studies on a large scale in low- and middle-income countries were the main reasons why we decided to calculate the completion rate using DHS, despite all its drawbacks.

Each element of the continuum of care for MHC provides essential and potentially lifesaving services and can be used to avert birth related complications. However, the completion status of MHC is in a paradoxical situation and varies from country to country. The greatest gap was detected between institutional delivery and postnatal care. Also, none of the retrieved literature touched on the completion status of the continuum of care for MHC and birth outcomes, which are among the indicators used to measure the quality of the rendered services for them, particularly in regions of the world where the burden of maternal and newborn morbidity and mortality is higher. Moreover, despite the considerable emphasis on the completion of maternal health service utilization in almost all African countries, particularly in Ethiopia, the contributing factors and health behaviors of mothers are still a budding and less understood area that needs further studies with strong design.

This review also examines the limitations of the included studies, and the reported limitations were different across the included studies. Some of the studies had limitations related to the comprehensiveness of the variables, some were the effect of the time-lag between use of the services and the date of the survey, variables uniformity, selection bias, and recall bias, social desirability, and study population, operationalization of variables, study designs, and quantitativeness of the study. Even though, this review was limited to LMICs and a few electronic databases, documentation of these problems was used to create the opportunity to designate researchers where the gaps were and where they had to emphasize in the coming studies to fill the gaps.

Generally, knowing the limitations and recommendations of the existing literature in this area helps us to know what we have to take into account, like the missed variables, service utilization, and birth outcome, systematic review to generate strong evidence, and other study designs like cluster randomized trials and longitudinal, qualitative studies to fill the indicated gaps and make the evidence in the indicated area more comprehensive.

Conclusion

The scoping review provides a broad and comprehensive review of the available literature on the completion of maternal health service utilization. The status of completion of care for maternal health care varies across countries. Also, there are limited studies on the continuum of maternal health care, and more than half of the studies in this area were from countries' Demographic Health Surveys, and all of them were cross sectional in design.

Recommendation

Based on the summary of the review results, the reviewers recommend well-structured, comprehensive, and robust study designs, such as Randomized Controlled Trial (RCT) or longitudinal-based primary research, in the area to fill the indicated gaps and recommendations. Furthermore, studying the effect of completion of maternal health care utilization on birth outcomes in regions of the world where the burden of newborn mortality is highest, like Ethiopia, is vital.

List of abbreviations

Antenatal care [ANC], Continuum for care [CoC]; Demographic Health Survey [DHS] ,Low and Middle-Income Countries [LMICs],Medical Subject Headings [MeSH], Millennium Development Goals [MGD], Maternal, Newborn, and Child health [MNCH] , Postnatal Care [PNC]

Declarations

Ethics approval and consent to participate: Manuscript has adhered to the ethical standards. However, consent to participate is not applicable

Consent for publication: Not applicable

Availability of data and materials: The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request

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Chapter Five: Article II

Completion of the maternal healthcare continuum: Barriers and facilitators among pregnant women in Jimma Zone, Southwest Ethiopia: a prospective follow-up study

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Abstract

Background: Continuum of care (CoC) for Maternal HealthCare (MHC) is a key strategy for enhancing the well-being of women and newborns. Achieving global targets for reducing maternal mortality requires the completion of key care stages (Antenatal, birth at facility, and postnatal) rather than fragmented. Thus, investigating determinants of completion for MHC is imperative to look into the existing strategies and recommending schemes.

Objective: This study aims to assess the completion, barriers and facilitotrs to the completion of the maternal healthcare continuum among pregnant women in Jimma Zone, Southwest Ethiopia.

Methods: A community-based prospective study was conducted from July 2020 to June 2021 among 1065 pregnant women in randomly selected woredas in Jimma Zone. Data were collected, entered using Epi-data, and analyzed with SPSS software. Binary logistic regression was used to select candidate variables for multivariate analysis. Multivariate analysis was performed to identify associations between the dependent and independent factors. The socioeconomic index was determined using Principal Component Analysis.

Results: The completion rate was 16.1% (CI, 13.8%–18.5%), with notable dropouts between the first and fourth ANC. Factors influencing MHC completion included semi urban residents (AOR: 1.73, 95% CI: 1.07, 2.81), women whose partners had a college or above (AOR: 5.60, 95% CI: 2.40, 13.08), government employees (AOR: 2.57, 95% CI: 1.28, 5.16), who were knowledgeable about ANC (AOR: 7.64 95% CI: 4.03, 14.48) and those who had completed recommended ANC service packages during the current ANC contacts (AOR: 3.39 95% CI: 1.94, 5.93) , parity (AOR: 1.86 95% CI: 1.11, 3.12), early booking for ANC (AOR: 2.10 95% CI: 1.45, 3.03), and supportive care (AOR: 2.03 95% CI: 1.07, 3.82). Additionally, topography, distance, transportation, facility proximity, and indirect costs were among factors influencing the completion for MHC.

Conclusion and recommendations: The CoC of MHC completion is low. Influencing factors include women's residence, partners' education, women's occupation, services provided during ANC, history of PNC use, parity, ANC booking time, knowledge of ANC and PNC, and care nature. To improve this, strategies should aim at women's economic empowerment, enhancing ANC and PNC knowledge, improving health facilities' capacity to provide comprehensive services, and making service delivery more supportive. Further research on the effect of CoC for MHC on birth outcomes is recommended.

Keywords: *Completion, Maternal Health Care, Continuum of care*

Introduction

Maternal healthcare [MHC] is globally recognized as an essential component of healthcare programs in both high- and low-income countries [HLICs], aimed at reducing maternal mortality (1). Antenatal Care [ANC], Institutional Delivery [ID], and Postnatal Care [PNC] are crucial components of MHC designed to prevent maternal and newborn complications and deaths worldwide (2). The continuum of care is a framework for providing MHC (3) that has become a core principle of programs for MNCH, which aim to reduce maternal, neonatal, and child deaths (4,5). To achieve the global targets of ending preventable maternal and under-five mortality, a complete maternal health care continuum including ANC, skilled birth attendance (SBA), and PNC is essential (6).

A meta-analysis on the effectiveness of antenatal to postnatal care in reducing neonatal, perinatal, and maternal mortality in low- and middle-income countries found that receiving care from antenatal to postnatal periods reduces the risk of combined neonatal, perinatal, and maternal mortality by 15% (7). However, studies conducted in various parts of the world found that dropouts across the continuum of maternal health care are a significant challenge. For example, a study conducted in Cambodia found that only 5% of mothers completed the continuum of care, with the highest discontinuation rate (73.6%) occurring during postnatal care (8). In contrast to what should be the case, a study conducted in Tanzania found that 96.5% of pregnant women received at least one ANC contact, 66.5% had four or more ANC contacts, 65% gave birth at a health facility, 22.5% attended PNC, and only 10% received all the recommended components of care (9).

A cross-sectional study carried out in Ghana to assess the continuum of care in the MNCH program found that only 8.0% of participants had completed CoC for MNCH. The greatest dropout was found between delivery and PNC within 48 hours postpartum (10). According to a study in Nigeria to assess the determinants of maternity care dropout, 60.6% of women received ANC, but 38.1% dropped out and never received SBA. Furthermore; 50.8% of those who received skilled delivery care did not attend postnatal appointments (11). A study conducted in Egypt demonstrated that 50.4% of the participants had achieved a continuum of care. Specifically, 90% had undertaken at least

four or more ANC visits; 85% delivered their babies with a SBA; and 53.2% received PNC (12).

Demographic and Health Survey data from nine countries (Bangladesh, Nepal, Pakistan, Ethiopia, Malawi, Rwanda, Senegal, Tanzania, and Uganda) were analyzed to assess the continuum of care pathways for maternal health in South Asia and Sub-Saharan Africa. The study revealed a significant dropout (more than 50%) occurring early in the continuum of care, between the first ANC visit and four or more ANC (13).

Furthermore, cross-sectional studies conducted in various regions of Ethiopia yielded varying results: 9.7% completion in Arbaminch Zuria woredas (6), 12.1% in the West Gojam Zone of the Amhara region (14), 9.1% and 6.56% according to the different studies using data from the Ethiopia Demographic and Health Survey (EDHS) 2016 (15,16), Motta town and Hulet Eji Enese district, Northwest, 47% (17), Enemay district, Northwest, 45% (3), Gondar Zuria and Dabat districts, Northwest, 21.6% (18),Debre Berhan Town, Amhara, 37.2% (19). These findings underscore significant disparities within results obtained from the same data set (EDHS 2016).

Numerous strategies have been devised and implemented to address these challenges, including bringing healthcare services closer to the community, community mobilization, improving service quality, preventing and treating complications, promoting safer pregnancies, and enhancing PNC (1,20–23).

Despite all these efforts, completion rates for MHC remain low, particularly in Oromia, where this study was conducted. Specifically, four or more ANC attendance was 40.6%, institutional delivery was 41%, and PNC within the first two days was just 26.1%. It's also worth noting that the country uses a non-standard definition of SBA, and so 5.8% of the work of SBAs is performed by Health Extension Works (HEWs) (20,24,25). All these studies highlight the need to investigate the motivations for completing MHC as well as the factors that contribute to non-completion. Research in this area can provide valuable information for policymakers, healthcare providers, and those designing strategies to improve the completion of MHC.

Methods and Materials

A community-based prospective study was conducted in Jimma Zone from July 2020 to June 2021. Jimma Zone is one of the 21 zones that make up the Oromia Regional State, located 350 kilometers southwest of Addis Ababa. It comprises 21 districts and two town administrations. According to the 2021 Jimma Zonal annual report of the Zonal Health Desk, the zone has a total population of 3,599,836. There are 562 Kebeles (local administrative units), served by one tertiary hospital, three general hospitals, five primary hospitals, 122 health centers, 512 health posts, 3327 health professionals of all types, and 1136 health extension workers (26, 27).

The study population comprised pregnant women in the randomly selected woredas of the zone who fulfilled the inclusion criteria. Pregnant women with a gestational age of less than or equal to 26 weeks, with at least one birth history, residing in the selected woredas, and who received their first ANC during enrollment were included in the study.

The minimum required sample size for this study was calculated using Epi-Info V.7.2.4.0 statCalc and two sample proportion comparisons based on several assumptions: alpha of 0.05 (95% CI), power of 0.8, a ratio of unexposed (incomplete CoC) to exposed (complete CoC for MHC) groups of 23.44, a probability of event (birth outcomes) in the non-exposed group at 25.78%, and the probability of event (birth outcomes) in the exposed group at 1.1%, with a design effect of two. Finally, to account for non-responses and loss to follow-up, a 10% buffer was added, resulting in a final sample size of 1065.

The cohort of pregnant women enrolled in the follow-up study was identified using a multistage cluster sampling technique. To begin with, the zone's 21 districts were identified and stratified based on population. Two districts were randomly selected from the 21. Subsequently, the two districts were stratified into semi-urban and rural kebeles. Then, using a simple random sampling method (lottery), 45 kebeles were selected from a total of 67 kebeles. Pregnant women were then enrolled in the follow-up study through house to-house visits and were subsequently tracked for their ANC, facility delivery, and PNC experiences **(Fig. 5)**.

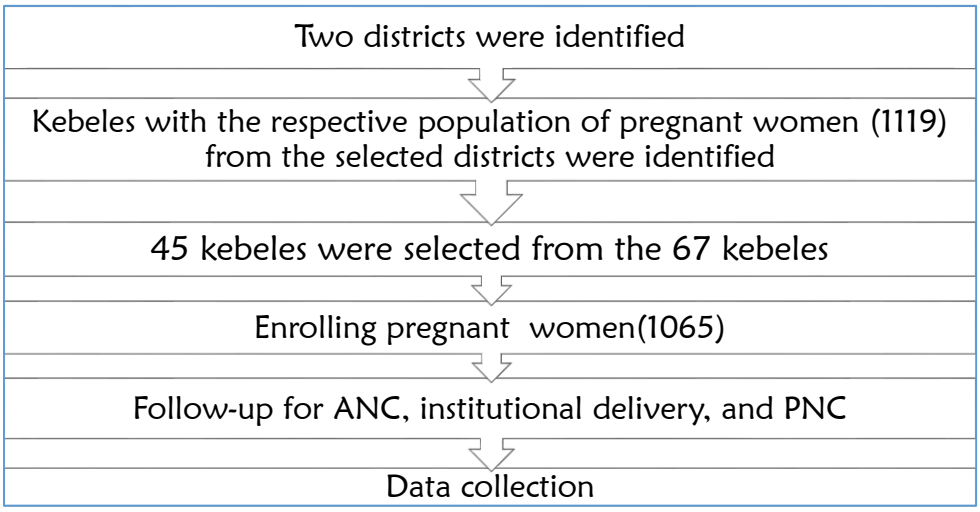


Figure 5 : Schematic display of the sampling procedure, 2020

For this study, the dependent variable was the completion status of the continuum of care for MHC. It was categorized as "complete" when a woman had at least four ANC appointments, assistance from a SBA, and at least one PNC visit after discharge or home delivery. The independent variables were categorized into three groups:

1. **Individual/intrapersonal factors:** Socio-demographics, socio-economic status (measured by wealth index), birth order, previous birth history, knowledge about ANC, ID, and PNC, previous maternal healthcare utilization, time of ANC booking, place of care, decision making autonomy.
2. **Interpersonal factors**: Information and advice given during ANC, ID, and PNC, perceptions about access to MHC, means of transportation; and social support.
3. **Social system factors** : women-centered maternity care, organization, dignity and respect, communication and autonomy, and supportive care

Data collection tools were adapted from various sources. Wealth index indicators were adapted from the Ethiopian Demographic and Health Survey (EDHS) (28). Indicator measures for Person-Centered Maternity Care [PCMC] were adapted from a validated tool to measure person-centered maternity care in developing settings (29). Maternal care practices were adapted from World Health Organization (WHO) guidelines (30). Data on determinants of MHC utilization were collected using structured questionnaires adapted

from various sources (29, 31–35). Questionnaires were prepared in English, then translated into 'Afan Oromo' to collect the data. Since this was a follow-up study, data were collected at three time points (Phase I, Phase II, and Phase III) using pre-tested interviewer-administered structured questionnaires.

During phase one, home visits were used to enumerate pregnant women. Sampled pregnant women in the 45 Kebeles were enrolled as a cohort for the study. Data collected in this phase include basic socio-demographic information, economic status, previous obstetric history, MHC utilization experience, and knowledge of MHC, services and advice received during the previous pregnancy, and services and advice received during the first ANC visit of the current pregnancy.

Phase II was at three months post baseline (fourth ANC contact, gestation 36–38 weeks). During this phase, mothers were followed to assess the completion of their ANC. Phase III took place 10 weeks after Phase II. The purpose of this phase was to assess maternal healthcare practices, birth outcomes, and access to maternal health services, women-centered maternity care, decision-making autonomy, and social support. The data collectors were informed about the relevance and objectives of the study and were trained on the study instrument and data collection procedure, including handling confidential information, informed consent, and interview technique.

The data collectors worked under close supervision, and debriefing sessions were held with the principal investigator, supervisors, and data collectors to address the challenges promptly and take corrective measures. The data were meticulously entered and cleaned before analysis.

Supervisors ensure data completeness and consistency. The collected data were coded and entered into Epidata V.4.6.0.2 to minimize logical errors and maintain skip patterns. The data were then exported to SPSS version 20 for cleaning, editing, and analysis. Descriptive analysis is performed to summarize the variables, by computing proportions and statistics. The wealth index was calculated using Principal Component Analysis (PCA). Knowledge of ANC, ID, and PNC, decision-making autonomy, information and advice given at or during ANC, ID, and PNC, social support, and women-centered maternity care were computed using operational definitions.

Bivariate analysis was used to examine the relationships between the dependent and independent variables and the selection of candidate variables for multivariate logistic regression by taking just one dependent and one independent variable at a time, which is equivalent to univariate logistic analysis. All variables with p-values less than 0.25 were included as candidate variables for the final model (36). A p-value less than 0.05 was considered statistically significant in multivariate logistic regression to determine factors associated with the continuum of care completion and an adjusted odds ratio with a 95% confidence interval.

Ethical approval was obtained from Jimma University, Health Institute, Institutional Review Board (IRB) Ref.No IHRPGD/433/2019 (27th November 2019). Administrative clearance was obtained from the zone and selected woredas health offices. Information sheets addressing the objectives of the study, and the benefits and harms were given to the study participants. Each respondent provided written, informed consent before data collection. Participation in the study was entirely voluntary. Consent was obtained for those participants unable to read by having the data collectors read it to them line by line. The participant's right to leave the interview at any moment was safeguarded. Data collectors were instructed to ensure confidentiality, give pertinent health information based on participant needs, and arrange referrals to medical facilities for mothers who had problems.

Results

The study was initially planned to include 1065 pregnant women who were selected at random. However, after excluding cases with incomplete data, instances of abortion, loss to follow-up, and maternal deaths, the analysis ultimately included 987 pregnant women, resulting in a response rate of 92.68% (**Fig. 6**).

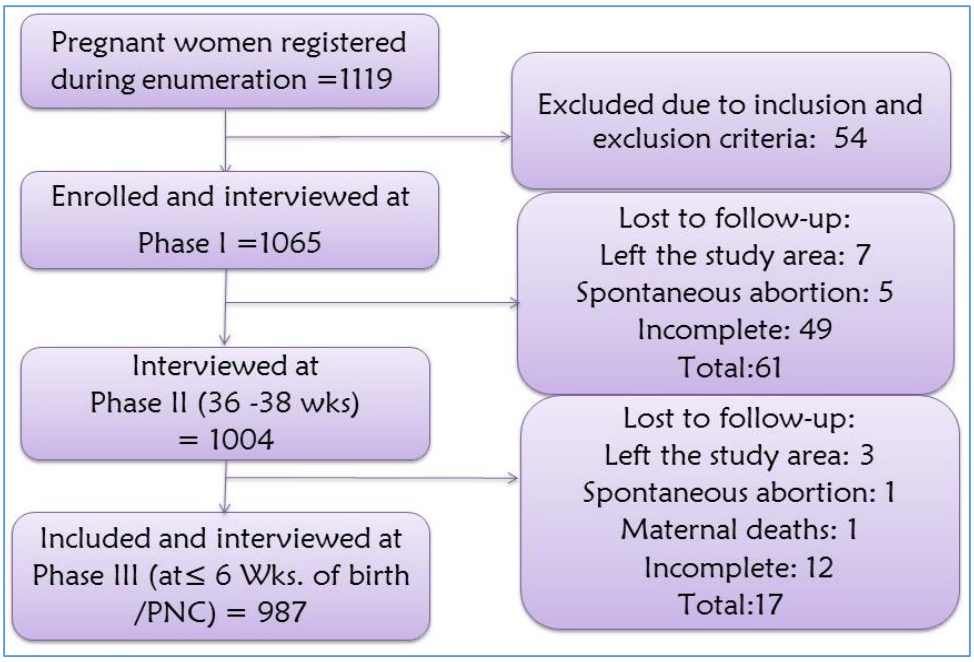


Figure 6: The overall study follow-up process, July 2020 to June 2021

Socio-demographic and economic characteristics

Of the 987 pregnant women included in the analysis, 527 (53.4%) were aged between 25 and 29, with a mean age of 26.63 (SD ± 3.89). The majority, 788 (79.8%) resided in rural areas. The predominant ethnic group was Oromo (89.7%), and Muslim was the dominant religion (84.3%). Approximately one-third of the mothers (35.8%) had no formal education. While two-thirds were housewives (68.3%). In terms of their current marital status, nearly all participants (98.6%) were married. More than two thirds of partners (69.2%) were farmers. One-third (321/32.5%) of the study group came from small families with similar economic status (**Table 2**).

Table 2: Distribution of the study participants by their socio-demographic and economic characteristics, July 2020 to June 2021, Jimma Zone, Ethiopia.

Variable	Category	Frequency	%
Age	≤24	258	26.1
	25-29	527	53.4
	30-34	143	14.5
	≥35	59	6
Residence	Semi urban	199	20.2
	Rural	788	79.8
Ethnicity	Oromo	885	89.7
	Dewaro	53	5.4
	Amhara	26	2.6
	Other*	23	2.3
Religion	Muslim	832	84.3
	Orthodox	103	10.4
	Protestant	52	5.3
Educational status of the pregnant women	No formal education	353	35.8
	Primary (1 to 4)	201	20.4
	Primary second cycle (5 to 8)	226	22.9
	Secondary and above	207	21.0
Educational status of the partner	No formal education	267	27.4
	Primary (1 to 4)	177	18.2
	Primary second cycle (5 to 8)	250	25.7
	Secondary	144	14.8
	College and above	135	13.9
Occupation of pregnant women	Housewife	674	68.3
	Gov't employee	129	13.1
	Merchant	112	11.3
	Other**	72	7.3
Occupation of the partner	Farmer	673	69.2
	Gov't employee	166	17.1
	Merchant	104	10.7
	Other***	30	3
Marital status	Married	973	98.6
	Other ****	14	1.4
Type of Marriage	Monogamy	919	94.5
	Polygamy	54	5.5
Family size	Small	321	32.5
	Medium	509	51.6
	Large	157	15.9
Wealth Index	Low	332	33.6
	Middle	324	32.8
	High	331	33.5

Other*=Gurage, Yemi, Kefa, Other**= Has no regular occupation, student, self-employee, Other ***=Deriver, no regular occupation, Sheki, self-employee, Other ****=Divorced , Widowed, Single

History of maternal health care usage

A significant proportion of the women (25.7%), had no history of ANC contacts during their index pregnancy. Of those who utilized ANC, (65.1%) received incomplete care; only (18.7%) received complete advice. Approximately 10% of patients (102 individuals) experienced complications during pregnancy. Of those who gave birth in a health facility, 613 (79.8%) of them stayed in the facility for less than 24 hours following delivery. 219 participants (22.2%) gave birth at home. From the total cohort, only (15.3%) received PNC after being discharged or having a home birth (**Table 3**).

Table 3: Distribution of the study participants by their past history of maternal health care utilization, July 2020 to June 2021, Jimma Zone, Ethiopia

Variable	Category		Frequency	%
ANC visit	Had		733	74.3
	Not		254	25.7
Services given during the past ANC(n=733)	Complete		256	34.9
	Incomplete		477	65.1
Advice given during the past pregnancy(n=733)	Complete		137	18.7
	Incomplete		596	81.3
Complications during past pregnancy	Had		102	10.3
	Not		885	89.7
Past place of delivery	Home		219	22.2
	Health Facility		768	77.8
Reason for choosing the last birthplace of birth	To deliver safely		620	62.8
	Had problem		125	12.7
	Other****		242	24.5
Means of transportation during the last birth(n=768)	On foot		533	69.4
	Others		235	30.6
Had complications during past delivery	Maternal	No	818	82.9
		Yes	169	17.1
	Fetal	Yes	51	5.2
		No	936	94.8
Duration of stay in the facility after delivery	Less than 24 hours		613	79.8
	24 hours or longer		155	20.2
PNC after discharge or home delivery	Yes		151	15.3
	No		836	84.7

SVD: Spontaneous vaginal delivery.

Other****: Previous complications, Referal, Time of labour onset, precipitated labour, No ambulance

Current use of maternal healthcare

The majority (78.8%) of women were multiparous, and 36.8% had a birth-to-pregnancy interval of two years or less, 82 (8.3%) had previous experience of bad obstetric history, 724 (73.4%) had their first ANC at health centers, 754 (76.4%) made a late booking for ANC, and 391 (39.6%) of them had four or more ANC. Regarding the place of delivery, 144 (14.6%) gave birth at home, and 151 (15.3%) chose the place of birth because of a health issue. Two hundred eighteen (22.1%) had maternal complications during the current delivery, and only 269 (27.3%) of them had PNC after being discharged or having a home birth. Overall, only 23 (2.3%) of the women included in this study had the recommended four PNC appointments within six weeks of giving birth (**Tab 4**).

Table 4: Distribution of the study participants by their current maternal health care utilization, July 2020 to June 2021, Jimma Zone, Ethiopia

Variable		Category	Frequency	%
Parity		Multiparity	778	78.8
		Grand multiparity	209	21.2
Birth to pregnancy interval		2 years or less	363	36.8
		More than 2 years	624	63.2
Previous experience of bad obstetrics history		Do not have	905	91.7
		Had	82	8.3
Where received ANC_1		Health Post	101	10.2
		Health Center	724	73.4
		Hospital	162	16.4
Time of booking for ANC		Early booking	233	23.6
		Late Booking	754	76.4
Had 4 and more ANC visits		No	596	60.4
		Yes	391	39.6
Complications during pregnancy		Had	36	3.6
		Not had	951	96.4
Place of delivery		Home	144	14.6
		Health facility	843	85.4
Mode of delivery(N=843)		SVD	800	94.9
		Caesarean section	43	5.1
Reason for choosing place of birth during current birth		To deliver safely	636	64.4
		Had problem	151	15.3
		Other	200	20.3
Means of transportation during current birth(n=843)		On foot	555	65.8
		Others	288	34.2
Average time taken to the health facility (n=843)		≥1 hour	658	78.1
		<1 hour	185	21.9
Complications during current delivery	Maternal	Yes	218	22.1
		No	769	77.9
	Fetal	Yes	61	6.2
		No	926	93.8
Had complications after delivery		Yes	61	6.2
		No	926	93.8
Had PNC after discharged or home delivered		Yes	269	27.3
		No	718	72.7
Where received PNC(n=269)		Hospital/Health center	179	66.5
		HP	35	13.1
		Home by HEWs	55	20.4
Means of transportation to PNC(n=269)		On foot	210	78.4
		Others	58	21.6

Knowledge of maternal health care and given services

The majority of participants (63.3%) were aware of ANC, while 91.6% were knowledgeable about SBA. However, 83.7% had no knowledge of PNC (**Table 5**).

Table 5: Distribution of the study participants by their knowledge of maternal health care and given services, July 2020 to June 2021, Jimma Zone, Ethiopia

Variable	Category	Frequency	%
Knowledge of the ANC	Knowledgeable	625	63.3
	Not knowledgeable	362	36.7
Knowledge of the SBA	Knowledgeable	904	91.6
	Not knowledgeable	83	8.4
Knowledge of the PNC	Knowledgeable	161	16.3
	Not knowledgeable	826	83.7
Services given during the current ANC	Incomplete service package	231	23.4
	Complete service package	756	76.6
Advice given during current pregnancy	Complete	886	89.8
	Incomplete	101	10.2

Person-Centered Maternity Care, Social Support, and Decision Making

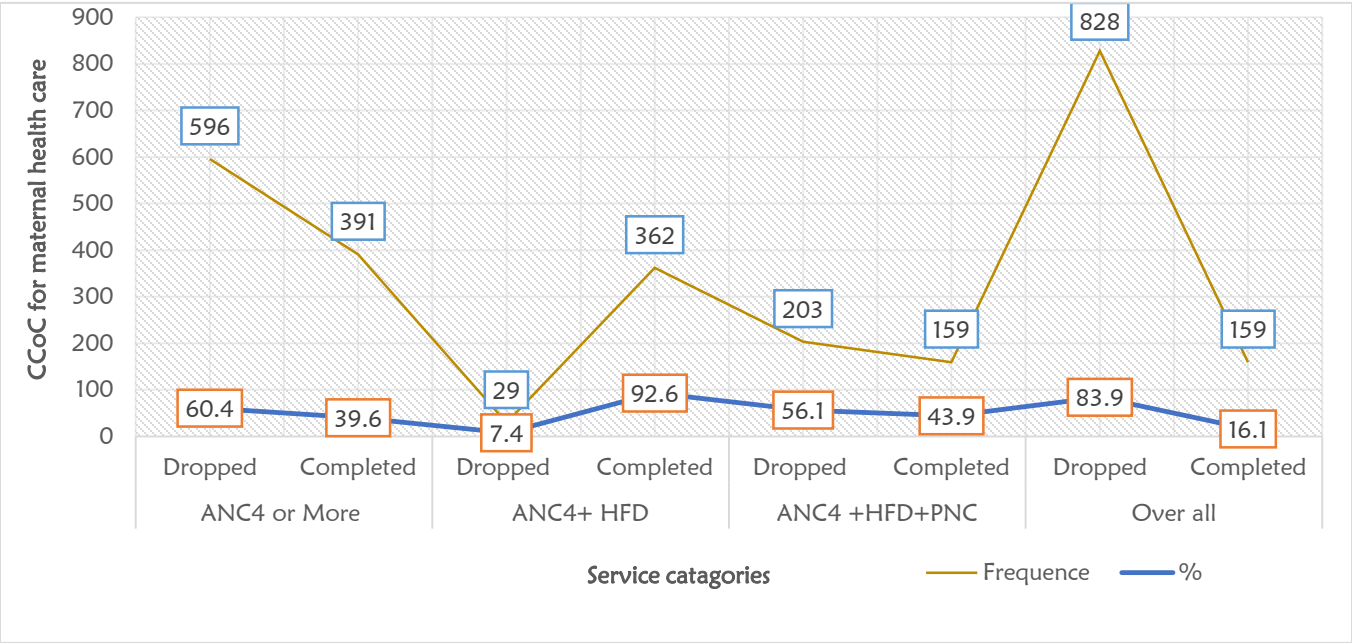
Five hundred sixty (56.7%) of women reported that they were not treated with respect and dignity, and 660 (66.9%) reported that they were not communicated and treated with autonomy. Six hundred ninety-six (77.9%) perceived that they received supportive care, 696 (70.5%) said they had social support, and almost all of them made a joint decision on access to MHC. Additionally, the overall PCMC was determined, and only 213 (21.6%) of them felt they received PCMC (**Tab 6**)

Table 6: Distribution of the study participants by Person-Centered Maternity Care (PCMC), social support, and decision-making on MNCH in accessing MHC, July 2020 to June 2021, Jimma Zone, Southwest Ethiopia.

Variable	Category	Frequency	%
Treatment with dignity and respect (n=987)	Treated with dignity and respect	392	39.7
	Not treated with dignity and respect	560	56.7
	Do not know	35	3.5
Treatment with communication and autonomy	Communicated and treated with autonomy	304	30.8
	Not communicated and treated with autonomy	660	66.9
	Do not know	23	2.3
Nature of care (n=893)	Supportive	696	77.9
	Not supportive	177	19.8
	Do not know	20	2.2
Trust in care providers (n=987)	Trust	908	92.0
	Not trust	69	7.0
	Do not know	10	1.0
Facility organization (n=929)	Good	294	31.6
	Not good	604	65.0
	Do not know	31	3.3
Overall PCMC	Treated with PCMC	213	21.6
	Not treated with PCMC	748	75.8
	Do not know	26	2.6
Social support	Had	696	70.5
	Not had	291	29.5
Decision making in MNCH	Joint	928	94.0
	Other	59	6.0

Completion of the maternal health care continuum

Of those women who started ANC, 391 (39.6%) had four or more ANC contacts, 36.7% (362/987) had four or more ANC contacts and gave birth at a health facility; but of those who had four or more ANC contacts, 40.7% (159/391) received PNC. The overall completion of CoC for MHC for this study cohort was 159/987 (16.1%) (**Fig. 7**).



HFD=Health facility delivery

Figure 7: The completion status of the continuum of care, July 2020 to June 2021.

Perceived reasons for dropping out of maternal health care

Women were asked about the reasons for dropping out of MHC. The most frequently reported barriers to care were lack of transportation, landscape and geography of the area, distance from facilities, lengthy wait times for services, inconvenience of service time, time of onset of labor, difficulty attending with a child, and high travel costs (**Table 7**).

Table 7: Difficulties to attend their maternal health services follow up among the study participants, July 2020 to June 2021, Jimma Zone, Ethiopia

Variable	Category	ANC(n=596)		ID (n=144)		PNC(n=964)	
		n	%	n	%	n	%
It is not necessary to go to a health facility	Disagree	589	98.8	144	100	940	97.5
	Agree	7	1.2			24	2.5
Unless there is a problem, it is not cultural to go	Disagree	580	97.3	144	100	921	95.5
	Agree	16	2.7			43	4.5
The service mode is not according to our customary	Disagree	590	99.0	144	100	952	98.8
	Agree	6	1.0			12	1.2
Too far, transportation, and the topography of the area	Disagree	341	57.2	47	32.6	423	43.9
	Agree	255	42.8	97	67.4	541	56.1
It costs too much to go to the facility	Disagree	475	79.7	106	73.6	832	86.3
	Agree	121	20.3	38	26.4	132	13.7
Poor quality of service	Disagree	569	95.5	144	100	935	97.0
	Agree	27	4.5			29	3.0
The facility was closed	Disagree	457	76.7	100	69.4	803	83.3
	Agree	139	23.3	44	30.6	161	16.7
No one has accompanied me to go	Disagree	580	97.3	144	100	944	97.9
	Agree	16	2.7			20	2.1
Partner/family did not allow	Disagree	587	98.5	144	100	954	99.0
	Agree	9	1.5			10	1.0
Partner wasn't supportive of going to ANC	Disagree	585	98.2	144	100	955	99.1
	Agree	11	1.8			9	.9
Don't trust health care providers	Disagree	584	98.0	144	100	948	98.3
	Agree	12	2.0			16	1.7
Inconvenient service hours	Disagree	549	92.1	-	-	959	99.5
	Agree	47	7.9	-	-	5	.5
Time of onset of labor (For ID)	Disagree	-	-	2	1.4	-	-
	Agree	-	-	142	98.6	-	-
Difficult to go with the child (For PNC)	Disagree	-	-	-	-	804	83.4
	Agree	-	-	-	-	160	16.6

Variables associated with the completion of the maternal health care continuum

On bivariate analysis, several socio-demographic and economic variables, as well as obstetric and MHC utilization factors, were significantly associated with the completion of CoC for MHC ($p< 0.25$). These factors included place of residence, educational status of both partners, occupational status of partners, family size, household wealth, history of ANC contacts, time of booking for ANC, knowledge about ANC and PNC, access to person-centered maternity care, and social support (**Table 8**).

In multivariate logistic regression analysis, several factors remained significant predictors of completing CoC for MHC: residency, educational status of partners, woman's occupation, service provided during previous ANC, history of PNC use, parity, time of booking for ANC, knowledge about ANC and PNC, service provided during the current ANC, and nature of care.

Women's residence was a significant predictor of the completion of the CoC for MHC. Semi-urban residents are nearly twice more likely to complete CoC than rural residents (AOR: 1.73, 95% CI: 1.07, 2.81). Additionally, women whose partners had a college or above were nearly six times more likely to complete the CoC compared to those whose partners had no formal education (AOR: 5.60, 95% CI: 2.40, 13.08). Government employees were almost three times more likely to complete CoC than other groups (AOR: 2.57, 95% CI: 1.28, 5.16). Knowledge of ANC, PNC, and services rendered during ANC were also associated with completing MHC. Women who were knowledgeable about ANC and PNC were almost eight and five times (AOR: 7.64 95% CI: 4.03, 14.48), (AOR: 4.88 95% CI: 3.21, 7.42), more likely to complete the CoC compared to their counterparts, respectively, and those who had completed recommended ANC service packages during the current ANC contacts were nearly two times (AOR: 3.39 95% CI: 1.94, 5.93) more likely to complete the CoC (**Table 8**).

Table 8: Binary and multivariable logistic regression of factors associated with completion of the CoC for MHC, July 2020 to June 2021, Jimma zone, Ethiopia

Variables	Categories	COR	95% CI	AOR	95% CI
		Completion (n=987)			
Residence	Semi urban	4.41	3.06,6.36	1.73	1.07, 2.81*
	Rural	1			
Educational status of the pregnant women	No formal education	1			
	Primary first cycle	1.68	.92, 3.09		
	Primary second cycle	2.68	1.56, 4.62		
	Secondary and above	7.95	4.82, 13.13		
Educational status of the partner	No formal education	1			
	Primary, first cycle	2.41	1.13,5.13	2.33	1.09,4.99*
	Primary second cycle	2.79	1.39,5.59	2.59	1.28, 5.24*
	Secondary	8.75	4.43, 17.29	5.03	2.31, 10.94*
	College and above	14.61	7.45,28.64	5.60	2.40,13.08*
Occupation of pregnant women	Housewife	1			
	Gov't employee	9.18	5.94, 14.19	2.57	1.28, 5.16*
	Merchant	2.36	1.37,4.07	1.02	.52, 1.98
	Other**	3.16	1.73, 5.80	1.34	.64, 2.82
Occupation of the Partner	Farmer	1			
	Gov't employee	7.95	5.25,12.06		
	Merchant	4.02	2.39,6.76		
	Other***	3.48	1.43,8.50		
Family size	Small	2.73	1.51, 4.95		
	Medium	1.56	.86.2.80		
	Large	1			
Wealth index	Low	1.65	1.08,2.49		
	Middle	1.13	0.73, 1.76		
	High	1			
ANC visit (past)	Had	5.06	2.76,9.28		
	Not	1			
Services given during past ANC	Complete	2.68	1.86,3.88	2.10	1.40,3.14*
	Incomplete	1			
Advice given during past ANC	Complete	1.41	.91, 2.19		
	Incomplete	1			
Last place of delivery	Home	1			
	Health Facility	13.59	4.98,37.12		
Means of transportation during past delivery	On foot	1			
	Others	1.37	.95, 1.98		
Reasons for choosing the place of birth during the last birth	Safe deliver	1			
	Had problem	1.12	1.78, .18		
	Other	.06	.02, .18		
Past PNC use	Yes	6.97	4.73,10.27	5.18	3.39, 7.9*
	No	1			
Parity	Multiparity (≤4)	2.19	1.32, 3.64	1.86	1.11, 3.12*
	Grand multiparity (>4)				
Previous experience of bad obstetric history	Not had	2.16	.98, 4.78		
	Had	1			

Table 8: Binary and multivariable logistic regression of factors associated with completion of the CoC for MHC, July 2020 to June 2021, Jimma zone, Ethiopia … Cont'd

Variables	Categories	COR	95% CI	AOR	95% CI
		Completion (n=987)			
Where received ANC_1	Health Post	1			
	Health Center	2.21	1.04, 4.69		
	Hospital	3.20	1.42, 7.22		
Time of booking for ANC	Early booking	2.37	1.65, 3.41	2.10	1.45, 3.03*
	Late Booking	1			
Mode of delivery	SVD	1			
	Caesarean section	1.94	.98, 3.81		
Knowledge of the ANC	Knowledgeable	9.90	2.04, 4.72	7.64	4.03, 14.48*
	Not knowledgeable	1			
Knowledge of the SBA	Knowledgeable	2.61	1.11, 6.10		
	Not knowledgeable	1			
Knowledge of the PNC	Knowledgeable	5.07	3.46, 7.43	4.88	3.21, 7.42*
	Not knowledgeable	1			
Services given during the current ANC	Incomplete	1			
	Complete	2.71	1.62, 4.53	3.39	1.94, 5.93*
Dignity and respect	Not treated with dignity and respect	1			
	Treated with dignity and respect	1.73	.68, 4.43		
Communication and autonomy	Not com. and treated with autonomy	1			
	Com. & treated with autonomy	.868	.41, 1.82		
Had a supportive care	No	1			
	Yes	1.78	1.00, 3.17	2.03	1.07, 3.82*
Social support	No	1			
	Yes	1.72	1.14,2.60		

*Other**** =Referral, time of labor onset, nature of labor (precipitated labor), lack of ambulance*

Discussion

The continuum of care has gained increasing attention in the context of maternal, newborn, and child health, with the aim of ensuring every woman and child receives timely and appropriate services throughout the continuum (37).The completion of the continuum is a crucial intervention to maintain maternal health during pregnancy, childbirth, and the postpartum period.

According to this study, only 16.1% (CI, 13.8%–18.5%) of women completed the continuum of care for MHC. Significant dropouts were observed between the first and fourth or more ANC contacts, followed by institutional delivery and postnatal care. This completion rate is higher than findings from studies evaluating the continuum of care for MHC in Cambodia, 5% (8), Tanzania, 10% (9), Ghana, 8 % (10), and Southern Ethiopia, Arbaminch Zuria woredas, 9.7% (6), West Gojam Zone of the Amhara region, 12.1% (14), as well as the evidence generated from EDHS 2016, which reported 9.1% and 6.56% the completion rates (15, 16). The variation in completion rates across studies can be attributed to several factors, including differences in geographical scope, study setting and design, sample sizes, the proportion of mothers receiving a service, and the criteria used for defining the completion of MHC. Additionally, the time gap between studies and the expansion in the number of health facilities and skilled professionals may contribute to varying results.

For example, studies from Cambodia, Tanzania, Ghana, and some from Ethiopia used data from Demographic and Health Surveys, which are susceptible to recall bias due to their retrospective nature. These cross-sectional studies rely on participants' memory of past events, potentially leading to under-reporting or over-reporting of service utilization to please the researcher. Furthermore, this study was undertaken during the COVID-19 pandemic, during which time the government paid increased attention to the demand for the provision of maternal health services. This contemporaneous change may have influenced the results. However, the completion rate in this study is still lower than the findings of the studies from various parts of Ethiopia, where completion rates ranged from 21.6% to 47% (3,17–19).

Even though the government paid attention to MHC during COVID-19, the pandemic has been recognized as one of the barriers to MHC use, with disrupted community mobilization efforts and changes to the cost and regulation of transportation (38). This could have influenced changes in completion rates. Additionally, the follow-up nature of this study may have reduced the likelihood of dropouts exaggerating their service utilization, a phenomenon that can occur in cross-sectional studies. These findings highlight the need for further efforts to reduce dropout rates and achieve the intended targets.

This study identified predictors for completing CoC for MHC. These predictors include: residence, partners' educational status, women's occupations, services provided during ANC contacts, history of PNC, parity, time of booking for ANC, knowledge of ANC and PNC, and the nature of care.

Partners' educational status emerged as a significant predictor of completion of the continuum of care for MHC. A woman whose partners had college education or higher was nearly six times more likely to complete the MHC continuum compared to those whose partners had no formal education.This suggests the importance of education to both women and their partners, as educated partners are more likely to support their wives in seeking healthcare. Residence in a semi-urban area increased the likelihood of receiving MHC, possibily due to better access to health facilities, higher education status, increased income, greater awareness of maternal health, access to media, and higher health-seeking behavior than those from rural areas. Women's occupation was a significant predictor of the completion of the MHC continuum. This might be because mothers with an income are more likely to make autonomous decisions. These women also have the financial capacity to cover indirect costs associated with MHC.

In this study, grandparental multiparous mothers were less likely to complete the CoC for MHC. An explanation for this may be previous favorable birth outcomes without any MHC. Also, having a large family, could impact socioeconomic status and the ability to cover indirect expenses for MHC. The services provided during ANC contacts were strongly associated with CoC completion for MHC. This finding was supported by a

systematic review and meta-analysis from Sub-Saharan African countries, which reported that mothers who attended at least four ANC contacts were more likely to give birth in a health facility (4, 39). Results such as these give weight to the current thinking that pregnancy is a window of opportunity for improving women's health in general. ANC contacts increase the quality of information women receive about MHC and allow patients to become familiar with medical personnel and health facilities (40, 41). The nature of the care provided (supportive care) emerged as another predictor of completing CoC for MHC. This is in line with the findings of a study conducted in Egypt, which showed that patients who had blood pressure checks, urine, and blood tests at ANC visits were more likely to use SBA and PNC (12). A positive correlation was also found when patients had counseling, and interactions with health workers (9, 37, 42)

The Strength and Limitation of the study

This study made it possible to assess the actual state of maternal healthcare practices. Additionally, a large sample size was used, resulting in great analytical power and precision. Despite the high sample size, due to the logistical complexities of the follow-up study, this study was based on limited districts. The dichotomization or classification of the composite variables at various cut-off points may have its own limits when referring to proportion. Also, all the possible efforts were made to use standards and as many variables as possible to make them more objective.

Conclusion and Recommendations

This study demonstrated that less than one in every five women completes the recommended continuum of care for MHC. Women's from semi urban and governmental employee, their partners' educational status, the services provided during ANC contacts, history of PNC use, parity, and time of booking for ANC, knowledge of ANC and PNC, and nature of care were found to be the predictors of completion of CoC for MHC. Hence, this study's results highlight that the dropout in MHC and detail the predictors for completion of CoC for MHC must be made known to those who determine health policy. It is vital to increase the quality of healthcare delivery, reduce complications related to

childbirth, and improve health outcomes. Additionally, efforts should focus on empowering women economically, enhancing knowledge of maternal health services, and strengthening health facilities' capacity to provide quality, supportive ANC. Furthermore, follow-up studies are recommended to fully understand the effect of completion of CoC for MHC on birth outcomes.

Declarations

Ethics approval and consent to participate: The manuscript has adhered to the ethical standards. Ethical approval was obtained from the IRB of the Health Institute, Jimma University. Informed consent was obtained from each respondent before actual data collection, and participation in the study was totally voluntary.

Availability of data and materials: Data are available from the corresponding author on request.

Competing interests: The authors do not have any conflicting interests to declare.

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Authors' contributions: SB, GT, MA, protocol development. SB, methodology, formal analysis, manuscript preparation, and all authors read, commented on the method, analysis, and approved the final manuscript.

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List of abbreviations

Antenatal care [ANC], Continuum for care [CoC]; Ethiopia Demographic Health Survey [EDHS], Facility Delivery[FD], Institutional Delivery [ID], Institutional Review Board [IRB],

Maternal Health Care [MHC],Health Extension Works [HEWs], Maternal, Neonatal and Child Health [MNCH],Principal Components Analysis [PCA], Postnatal care [PNC], Skill birth attendance [SBA] Spontaneous vaginal delivery [SVD], World Health Organization [WHO] , Weeks [Wks]

Operational definitions

- Knowledge about ANC:Antenatal care refers to the care provided to a pregnant woman from the time that pregnancy is confirmed until the onset of labor. The composite index was computed by adding the eight responses, and the demarcation threshold formula was used. Those who scored sixteen or more were classified as "knowledgeable," otherwise "not knowledgeable."(43,44)

- Knowledge about facility delivery: Facility-based delivery is one of the maternal health services provided by SBAs within the healthcare facility. The composite index was computed by adding the five responses, and the demarcation threshold formula was used. If the computed value is ten or more, it is considered "knowledgeable," otherwise “not knowledgeable." (44,45)

- Knowledge about PNC: PNC is defined as care provided to the mother and her newborn baby immediately after the birth of the placenta and for the first 42 days of life. The composite index was computed by adding the six responses. By using the demarcation threshold formula, those who scored twelve or more were considered "knowledgeable," otherwise “not knowledgeable (44, 46)

- Services given during ANC: are the care provided to a pregnant woman from the time her pregnancy is confirmed to the commencement of labor. The index was computed by adding the 11 responses, and the demarcation threshold formula was used. Those who scored 22 or more were categorized as "complete," otherwise "incomplete." (44,47)

- Advice given at or during ANC: is useful information given to a woman to assist her in having a healthy pregnancy and improving pregnancy outcomes. It includes advice

regarding ANC time and times, the Birth Preparedness and Complication Readiness (BPCR) plan, danger signs, the usage of Insecticide-treated bed nets (ITN), a healthy diet and exercise, and exclusive breastfeeding. By summing the six responses, the composite index was calculated. Finally, using the demarcation threshold formula, those who scored twelve or more were categorized as "complete," otherwise "incomplete (44)

- Family size: is the number of people who reside together as part of the same household and who are related by birth, marriage, or adoption. Categorized as: Small: up to 4 members, Medium: 5-7 members; and Large: 8 or more (48)

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Chapter Six: Article III

Why do women walk away from maternal healthcare in Jimma Zone, southwest Ethiopia? A qualitative study of caregivers' and clients' perspectives.

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Abstract

Background: The Continuum of Care (CoC) for Maternal Health Care (MHC) is a key strategy for reaching mothers and babies at crucial times, and providing continuity of care through pregnancy, childbirth, and afterbirth. However, understanding is limited on why women in Ethiopia are dropping out of this MHC.

Objective: This study aims to explore the underlying reasons why women walk away from maternal health care in Jimma Zone from the perspectives of care providers and clients.

Methods: The population for the study was comprised of all purposefully selected district health department deputy heads, MCH coordinators, primary health center unit directors, midwives and nurses in charge of the maternity department, and chosen women among those attending the MCH clinic for maternal health services in order to identify reasons for dropout from the perspective of the service users based on the established criteria. The final sample size was determined based on the level of information saturation, and a total of 20 in-depth interviews were conducted. An unstructured key informant in-depth interview guide was used to collect data to gain an in-depth understanding of the context in which the CoC for MHC takes place and the existing barriers.

Result: The main themes were identified and compared across all transcripts to determine similarities and variations in the respondents' views. The major reasons why women walk away from maternal health services were categorized under three main themes: healthcare system-related reasons, community-level barriers, and individual-level barriers. Interpretation was conducted, and elucidations of the results follow the respective themes. Verbatim that captures dominant views was considered wherever appropriate to substantiate the findings.

Conclusion and recommendations: Women walk away from maternal health services due to health system, community-level, and individual-level factors. Hence, implementing initiatives to improve both providers' and clients' side barriers is essential. Furthermore, we recommend more large-scale studies to unearth more context-specific barriers.

Keywords: *Maternal health services, caregivers, clients, Jimma zone, Ethiopia*

Introduction

The Continuum of Care (CoC) was initially applied in the 1970s. CoC for Maternal Health Care (MHC) is a continuity of care through pregnancy, childbirth, and after birth, serving as a key strategy in reaching mothers and babies at a crucial time (1–3). Recently, the CoC has gained attention in MHC to ensure that each woman and child receives timely and appropriate care during pregnancy, childbirth, and postnatal periods (4,5).

Despite the implementation of a range of maternal health interventions, maternal mortality remains high in many low- and-middle-income countries (LMICs) (6). Dropout from CoC for MHC, which is a basic package and critical for women and their infants' survival and wellbeing, is widespread in low-resource settings, with postnatal care visits being the most affected (7). In Africa, each year millions of women die of pregnancy-related causes, millions of babies are stillborn or have low birth weight, and others live with neonatal complications. Many of these problems occur at home, unseen and uncounted in official statistics (8), while this is a key in achieving the Sustainable Development Goal (SDG) target of reducing the global maternal mortality ratio to 70 per 100,000 live births by 2030 (9).

The World Health Organization (WHO) considers Antenatal care (ANC) as a platform for healthcare functions, including health promotion, screening and diagnosis, and disease prevention (10, 11). Mounting evidence indicates the importance of making the recommended number of ANC contacts in increasing use of facility delivery and postnatal care, and the positive correlations among the number of ANC contacts, use of Skilled Birth Attendants (SBAs), and postnatal care (PNC)(12–15).

However, there is a disparity between the annual number of first ANC contacts and deliveries held at a health facility, and the annual number of new ANC contacts and the annual number of health facility deliveries is approximately 3:1 or even 4:1(16). On the other hand, women who had ANC follow-up, by default, would have access to health facilities for facility delivery and PNC. However, there is a huge disparity across this care in LMICs, including Ethiopia (17).

Ethiopia has established a number of strategies and programs to enhance and improve the use of facilities for health care services, including MHC (18). Averting maternal, newborn, and child mortality and morbidity is a top priority. A lot has been done both at the community and facility level, like capacity building, health facility expansion, health system governance, human resources, birth preparedness, culture practices, health extension works, social networking, pregnant women forums, maternity waiting homes (MWH), and ambulances to ensure access to skilled providers for the last three decades (12,15,19,20).

Despite all these efforts, the CoC for MHC remains low. Research evidence indicates that more than three-fifths of pregnant women receive at least one ANC follow-up, yet only one in five give birth in a health facility (21). According to the EDHS 2019, 47.5% of women gave birth at healthcare facilities, but only 34% had PNC within the first two days. Particularly in Oromia, where the study was conducted, 41% attended healthcare facilities for birth and 26% attended PNC within the first two days. However, maternal mortality is still high compared to global targets, creating a paradoxical situation (22). The root causes of these are not clearly known. These might be either the barriers faced by clients, factors resulting from the perceptions and understanding of the services by the clients, or provider-related factors that might affect the quality of care and client satisfaction. Evidence from the perspectives of providers and clients about factors leading to dropouts from care among women in Ethiopia is limited. Hence, the qualitative exploration of the perspectives of both clients and providers is crucial in understanding the factors leading to these dropouts once they start the MHC utilization.

Methods and Materials

Study setting

This study was conducted at health facilities and offices in the Jimma Zone from November to December 2021. Jimma zone is one of the 21 Zones of Oromia Regional State, situated at 350 kms from the capital, Addis Ababa, in the southwest of Ethiopia. The zone comprises a total of 21 rural districts and two town administrations. According to the Jimma Zonal annual report of the Zonal Health Desk, the zone has a total population of 3,599,836 in the 21 woredas, 562 Kebeles. The zone has, one tertiary hospital, three general hospitals, five primary hospitals, 122 health centers, and 512 health posts (23).

Study design and population of the study

This exploratory qualitative study was aimed at exploring factors affecting the continuum of care for MHC from the perspective of both clients and providers. The population for the study comprised all purposefully selected district health department deputy heads, maternal and child health coordinators, primary health center unit directors, midwives or nurses in charge of the maternity department, and those who have been rendering maternal health services for at least one year. These individuals were chosen by the investigators based on established criteria, which include their position, proximity to the activities, work experience, and consent to be interviewed as key informants.

In order to identify reasons for dropout from CoC for MHC from the perspective of the service users (women),we also included purposefully chosen women among those attending the MCH clinic for maternal health services (ANC , delivery, and PNC) during the study period based on their experience of past maternal health service utilization.. A criterion-based purposive sampling technique was used, and a total of 20 in-depth interviews with 12 HCPs and 8 women conducted. The final sample size was determined based on the level of information saturation (data collection was concluded when we found no new emerging themes), and all the emerging themes were supported through subsequent data collection (Tab 9).

Table 9. Summary of selected individuals for interview, data sources, and methods, November to December 2021, Jimma, Ethiopia.

Method	Description	Sample
IDI with woreda health department people	Interviews with the woreda health department deputy head and MCH coordinator based on their proximity to maternal health services	Two woredas and two individuals per woreda
IDI with health care providers	Interviews with MCH health care providers	Eight health facility and one care provider per facility
IDI with caretakers	Interviews with women attending the MCH clinic during the study period	Eight health facilities and one caretaker per facility

Data collection

We identified individuals who met at least one of the established criteria prior to data collection. The unstructured key informant in-depth interview guide covers information about maternal health care, women's autonomy, health care-seeking behaviors, the health care environment, socioeconomic barriers, common socio-cultural practices during pregnancy, childbirth, and after birth in the community, perceptions towards maternal health care, acceptance of health care providers, their real experience, and recommendations that they think it affects the CoC for MHC was used for both participants to collect data to gain an in-depth understanding of the context in which the continuum of care for maternal health care takes place and barriers to existing health services. The data were collected through face-to-face from an insider perspective using the third person questions to enable respondents to talk about issues without personal attribution. A convenient location (their office and duty station for health care, and a maternity waiting area for mothers) was selected by participants and interviewers. The lead investigator/the PhD student, and research assistants conducted interviews that lasted 30 minutes on average.

Data analysis

The field note, interview note, and tape-recorded interviews were transcribed and translated into English by a research assistant and lead investigator. Our data was primarily

comprised of interview transcripts and field notes. The fully transcribed audiotaped and field notes of the interview were read and re-read. The transcripts were then given their own color coding, and the identified codes were compared across all transcripts to determine similarities and differences. Similar codes were combined and rearranged into higher-order categories. Data and codes were then reviewed in order to determine similarities and differences in respondents' perspectives, subthemes and themes. Accordingly, different main themes and subthemes were found, named, and reported (**Table 10**). Interpretion and elucidation of the results follow the respective themes, and verbatim that captures dominant views was considered wherever appropriate to substantiate the findings.

Data quality maintenance

We recruited and trained data collectors who are familiar with the local culture, who are fluent speakers of the local languages, and who have adequate experience in qualitative research methods. As the quantitative portion of this study was a prospective follow-up study that increased our familiarity with the setting where the qualitative study was done, we also made an attempt to strengthen the credibility of the findings by getting a rich picture of the context. The role of the lead investigator was preparing the proposal, data collection, analysis and interpretation of the data. Similarly, a thick and rich description of the research processes, data collection, analysis, and context of the study were reported to maintain the transferability and reflexivity of the study findings.

Ethical Considerations

Ethical clearance was sought and obtained from Jimma University; Institutional review board (Ref.No. IHRPGD/433/2019). Participation was entirely voluntary based, and participants were informed that at any time during the interview, they could drop out the study. Participants received an explanation about the purpose of the study, were invited to participate, given the opportunity to ask questions about things that may have been unclear, and were asked to provide oral consent. De-identification and confidentiality were ensured by using numbers and fictitious names to describe and identify participants.

Results

We conducted the qualitative study to find out the underlying reasons why women dropout from MHC after starting care utilization from the care providers and clients'prospectives among the criterion-based purposefully selected participants. A total of 20 participants took part in the study, and their characteristics are summarized as follows **(Tab.10)**

Table 10: Summary of participant's characteristics, November to December 2021, Jimma Zone, southwest Ethiopia.

Characteristics of participants		Number
Age in years	Ranges from 24 to 37	
Sex	Female	10
	Male	10
Marital status	Single	2
	Married	18
Educational level	Diploma	3
	BSc	10
	Other (no formal education, formal education, and a certificate)	7
Profession	Public officer	3
	Midwives	5
	Nurses	4
Work experience (in years for HCPs)	Ranges from 3 to 12 years	
Occupation of the women	Housewife	5
	Other (gov't and self-employee)	3
Total		**20**

Based on the interview results, we recognized that MHC continuation was limited by various motives. However, in this particular paper, the identified factors were characterized under three main themes and twelve subthemes. The three main themes that were considered as a fundamental reasons underlying why the women dropout across the continuum of MHC were healthcare system, community and Individual level barriers (**Tab 11**). These themes were analyzed, interpreted, and presented; verbatim quotes that represent the broader views of the participants were used to substantiate findings under each category.

Table 11: Categories of themes and subthemes, November to December 2021, Jimma, Ethiopia.

Theme	Subthemes
Barriers in the healthcare system	Shortfall in supplies and infrastructure (drugs, electricity… and water)
	Misuse of the terms responsibility and accountability
	High staff turnover and human resource shortage
	Poor linkage and referral systems
	Current situation (COVID_19)
Community level barriers	Socio cultural /norm
	Less attention to the forum
	Weak community level structure
Individual barriers (women and healthcare providers).	Knowledge and sense of fatigue as GA advanced
	Late booking for ANC
	Loss of motivation
	Socioeconomic

Barrier 1: Health system related factors

The key reasons highlighted by health workers as barriers in the healthcare system agonizing the continuation for MHC were: shortage of supplies, logistic, and infrastructure (drugs, laboratory service, electric power, water supply, and functional maternal waiting home); miss use of the term responsibility and accountability; shortages of human resources at facilities; care provider turnover; poor communication (poor linkage and referral system) among woreda, health centers, and health posts; and miss interpretation of the current situation (COVID_19).

Barrier 1a: Shortfall in supplies and infrastructure

Supplies and infrastructure are among the barriers identified as barricades to the continuation of maternal health care in the study areas. High costs of visits to health facilities are associated with transportation issues and difficult road conditions. Transportation costs and the state of the roads were also cited as obstacles to maternal health service utilization. Participants also mentioned a number of facility limitations, such

as the malfunction or complete absence of utilities like the water supply, medical equipment, electricity, and maternity waiting area. These constraints in the facility were among the reasons why service providers did not offer the required level of services, which would have had direct (unnecessary referrals) and indirect (providers' commitment to offering care) effects on the continuity of maternal health care use, and one of the care providers claimed this by saying:

> *Lack of road access, distance, landscape of the area are the known and evident challenges. I [care provider] know that mothers are coming to the health facilities fleeting all these challenges. However, we [care providers] lack supplies to provide them [mothers] with quality services that encourage them [Mothers] to return for more services. For example, currently we [care providers] lack drugs,* a *blood pressure cuff, a weight scale, laboratory services, functional maternity waiting home, electricity, and water supply… we [care providers] fetch water from a river using a donkey and or human power, which costs us 20 birrs for a jar containing 20 liters.*
>
> *[Health care provider at Defkela Health center]*

Also, another interviewee from the service users' side elaborated on barriers related to infrastructure, saying:

> *[…] as a resident of Boneya kebele, I have experience to share. A mother started laboring at midnight, and we want to take her [the laboring mother] to the health center by traditional ambulances. However, she [the laboring mother] gave birth on the way and developed heavy bleeding, she passed away on the way to the health center. Now there is ambulance service. However, the ambulances were unable to reach our kebele during the summer season due to the road conditions.*
>
> *[Caretaker at Boneya Health center]*

Barrier 1b: Responsibility and Accountability

Hypothetically, understanding responsibility and accountability enables care providers to diligently perform their daily duties and fosters a culture of accountability among them. This understanding also makes them comfortable enough to seek help from a co-worker

or manager. However, one of the interviewed care providers highlighted the reality of a flawed understanding of responsibility and accountability in their area of work, stating:

> *[…]If you lie, you stand a better chance of advancing in education or receiving a promotion. However, speaking and reporting the truth about your actions could result in demotion or insult. For these reasons, we have chosen to lie. Also, if you go up from the Primary Health Care Unit [PHCU] to the woreda, zone … the common phrase is that the caregivers are not fulfilling their duties. This saying is currently demotivating caregivers and preventing them from performing their duties as expected. Even they [care providers] are aware of this saying and confirmed it in the local language by saying, "Oogeessi hojii keessa hin jiruun hojii keessaa nubasee."*
>
> *[Health care provider at Korjo, Health center]*

Other care provider also said:

In my opinion, there is no system that holds healthcare providers accountable based on evidence; rather, every thinning is based on devotees. Care providers in a PHCU are divided into three groups: supporters of the PHCU director, opponents of the director, and those in the middle. This categorization results in a lack of team spirit in the facility, less engagement in community mobilization, friendly service, advising or counseling clients to return to the facility, and a compromise of service quality, which pushes the community away from service utilization rather than pulling.

[Health care provider at Odo Hidhata Health center]

Barrier 1c: Shortage of care providers and staff turnover

Obviously, the shortage of manpower and high turnover disrupt service operations, leading to the loss of experienced and trained staff, fatigue and negligence, unnecessary referrals, and failure to respond to women's preferences. This results in dissatisfaction with the work climate, an imbalanced composition of new and experienced staff that leads to difficulty in arranging work schedules, increased workloads, and the provision of lower quality services. All of these factors contribute to the discontinuation of the service utilization. Despite the fact that the ANC period is regarded as an ideal time to discuss the continuum of MHC, listen to the women's concerns, and provide them the proper

information on when and where to go as well as what they need to do, the shortage of human resources may prevent health professionals from giving patients enough health information. According to one respondent:

[…] we are working for longer hours (24 hours) due to a manpower shortage. Allow me to describe this month's scenario. Currently, there is only one midwife managing three units: ANC, labor and delivery, and family planning. I find it hard to believe that he is providing these services, screening, effective reassure and counseling as expected to be given due to duty overload and a lack of time, and these substandard services, coupled with less information and reduced community engagement, may lead to a discontinuation of maternal health service utilization.

[Health care provider at Defkela Health center]

On the other hand, the interviewed mothers described as the mothers seeks much information and advice from caregivers. One of the pregnant mothers reflected her feelings, saying:

> *[…] our women are not well educated and need follow-up and advice from care givers. In short, uneducated women are like metal. She [the woman] addressed this with the proverb "wallaalan akkuma sibilaati yoo ta'anii, ta'anii moorodan malee," which means that what you sharpened last year will not stay sharp forever. So, our mothers need continued follow-up and awareness creation, like the metal sharpening process.*
>
> *[Pregnant mother, Odo Hidhata health center]*

Barrier 1d: Poor communication (poor linkage and referral system) among woreda, health centers, and health posts

One of the barriers to low utilization of maternal health services and dropout was the lack of strong linkage and communication among woreda, health centers, and health posts. This is explained by the following quote from a health care provider:

> *"In theory, health extension workers (HEWs) are expected to work in accordance with their (HEWs) packages. However, they are forced to manage other non-health sector activities, spending a significant portion of their time on non-health sector*

activities. For example, they are currently collecting government taxes and working on HEWs-related activities only twice a week, which is our bigger problem"

[Health care provider at Korjo Health center]

Other care provider also said:

"…Practically, the mothers are expected to receive ANC2 and ANC3 at the health post level, but we lack strong communication with HEWs. Even in this case, it is difficult to know who completed their ANC and who did not, and I know this from the report"

[Health care provider at Alle Health center]

Other care provider also mentioned:

"As to me [care provider], our health systems communication is seasonal and active when only top administrative level communication is available, when the regional health bureau awakens, the zone, woreda, and PHCUs are too otherwise …"

[Health care provider at Asendabo Health center]

Barrier 1e: Misinterpretation of the current situation (COVID_19)

COVID _19 has been identified as one of the barriers to the utilization of MHC in a variety of ways. The effect of COVID _19 was explained in this study by the interruption of pregnant women's mobilization by HEWs through house -to-house visits, the interruption of pregnant women forums, the modified transportation regulation during this period that limited /reduced the number of passengers per vehicle by half and increased the cost of transportation, the health information given to society about COVID-19, and the effect of COVID-19 on pregnant women.

The quote from one respondent was:

[…] Yes, we discussed these issues [problems related to maternal health service withdrawal] in detail with the woreda health administration, kebele leaders, and kebele managers last year. However, due to COVID_19, there is no mobilization of pregnant women for services through house -to-house, and the transportation cost, which was five birr previously, has now increased to 25 birr. As these mothers are from low-income families, they do not come for these services.

[Dedo woreda health office]

Also, another pregnant mother elucidated this with the quote:

> *[...]You [caretakers] are teaching us [Mothers] about COVID-19 and its effect on pregnant women... Personally, I am afraid to visit a health facility because I don't know who is infected, and I will only do so if I have no other choice.*
>
> *[Mother from, Alle Health center]*

Barrier 2: Community level factors

Sociocultural factors, trust in care providers, less attention to forums, and a weak community level structure (such as the women's developmental army, the male developmental army, and the Gare) were identified as community level barriers to the continuation of MHC utilization.

Barrier 2a: Sociocultural factors

Because of a variety of factors, such as time of labor onset, not knowing their gestational age, and geographical and societal norms, most women who give birth at home are assisted by their elder untrained women in the community. This is demonstrated by the following quote from one of the women participants:

> *Most of us [the mothers] had no idea about our [the mothers'] gestational age, and what you [care providers] told us [the mothers] was far from our [the mothers'] time of labor delivery. Furthermore, it is culturally unallowable for us [the mothers] to leave the home after the onset of labor, even to go to the health facility for labor delivery, due to the fear of what we [the community] locally refer to as "Michii," which complicates the labor delivery process. As a result, we [the mothers] prefer to give birth at home.*
>
> *[Pregnant mother from Defkela health center]*

Other care providers elucidated by the quote:

> *[...] In my experience, home delivery is perceived as normal, whereas facility delivery is appropriate for the sick or those who have complications. Similarly, the majority of the mothers did not know their [the pregnant mothers'] gestational age and EDD, which we [care providers] tell them [the pregnant mothers], but this*

usually varies from their [the pregnant mothers'] actual time of delivery, and sudden onset of labor could also be one of the barriers for them [the pregnant mothers'] not delivering at the facility.

[Health care provider at Asendabo Health center]

Other care providers also said:

During delivery at night, the caregivers usually tie the hand torch to the head or hold it in the mouth. This method [tying the hand torch to the head or holding it in the mouth] directly projects the light into the woman's birth canal, causing discomfort and causing mothers to avoid coming to the health facility for delivery.

[Omo Nada, Woreda health office]

The client's trust in the care provider's advice and treatment is an essential component of the care provider-client relationship. Untrust in providers may exacerbate disparities and lead to the discontinuation of maternal health services.

This is explained by the quote from one of the interviewees:

The victimed person is the right person to detect his/her own problem and to care for himself /herself, which they [mothers] locally called "Of maramaruuf abbuma wayyaa …our communities culturally do not allow women to leave the home until they are 49 days postpartum, and … we call it locally "Gaaddidduu."

[Health care provider from Alle Health center]

Barrier 2b: Pregnant women forum

The interviewees acknowledged the lack of awareness creation programs at the health care facilities and community level, including the pregnant women forum and a regular meeting of the Women Development Army.

This is explained by a quote from one of the participants:

[…] It is healthier if the community receives more information about complications during pregnancy, as well as during and after delivery... they [mothers] will

understand more about these complications [danger signs], and most of the time our community does not pay attention to problems after delivery.

[Mother from, Asendabo Health center]

Barrier 3: Individual (Mothers and HCPs) level factors

Women's knowledge of their gestational age (GA), fatigue as GA progressed, misinterpretation of concepts, late booking for ANC, loss of motivation, and socioeconomic status were amongst the accentuated individual (maternal and health care providers) barriers to the continuation of MHC.

Barrier 3a: Feeling tired

The women also shared their own experiences, saying:

As gestational age advances, I [the women] become tired of walking a long distance on foot to reach health facilities, and we [the women] the access to the health facility is what you know and see. You [care provider] also know what will happen as the gestational age advances.

[Pregnant mother from Metoso health center]

Another pregnant mother elucidated this with the quote:

[…] Personally, I [pregnant mother] have difficulty walking and don't have the same power that I had during the ANC1 compared to when my gestational age advanced and I got closer to term, and this is my main difficulty in continuing to use my services *[Pregnant mother from Defkela health center]*

Barrier 3b: Late booking for ANC and Misinterpretation of the concepts

One of the reasons for not completing the MHC was the late booking for ANC due to various contributing factors. In this study, critical concerns include a lack of awareness about ANC services, a lack of complete MHC service packages at health facilities, and how care providers report the findings of their assessments and investigations.

One of the health center MHC coordinators explained, saying

[…] yes, this [MHC] is our [caregivers] concern too, the mothers are not coming back for ANC4 after ANC1, if you look at our reports, we are reporting more than 100 ANC1 per month, but delivery and ANC4 were much less; this could be related to the approach we are using [ANC 2 and ANC 3 are given at health post level by HEWs]. This may be among the reasons why they [women] drop out of the follow up based on our [caregivers] observations.

[Health care provider from Metoso health center]

Another pregnant mother elucidated this with the quote:

[…] After the investigations, they [caretakers] told us [the mothers] the results of the examination, saying there was no problem, in local language, "Rakkoon hin jiru"... Since a woman is told there is no problem, most of them [women] believe there is no problem and why they [women] bother to get back to a health facility without having a problem. For me this is among the barriers why women drop out their follow up.

[Mother from, Gudeta Bula Health center]

Barrier 3c: Loss of motivation

The lack of infrastructure, like nature of the road, distance, location of the health center, distance of health post from health centers and topography of the woreda, availability of transportation, and availability of service packages at the facility were known barriers for underutilization and continuity of maternal health services , and now one of the emerging barriers was dishonesty, which we [care providers] refer to in local language: Sobanii barnoota argachuu, dhugaa gabasanii harrabsamuu... Kanaaf soba filanne and the majority of us [the caregivers] have been following the 59 principles, which means start working at 11:00 a.m. and leaving at 3:00 p.m.

[Health care provider from Korjo Health center]

Barrier 3d: Socioeconomic

Despite the fact that maternal health care services are provided for free, one of the identified barriers to the continuation of maternal health care service uptake in this study

is the cost of the services. It was evident from the study that costs, both health and non-health expenses, are significant obstacles to obtaining maternal care services in the study area. In this regard, it was noted that only a small number of well-to-do individuals in the community have access to health facilities. Frequent drug stock-outs in the health facilities require that women have to purchase prescribed medication, which is sometimes unaffordable for families with limited resources.

One of the key informants said

[…] also, after my assignment here, I taught that the indirect cost, the cost mothers pay for transportation, is much higher than the direct cost, and we call it the user-fee exemption policy for maternal and child health services, which has been less successful in making access to MHC equitable across economic categories.

[Health care provider from Asendabo Health center]

Discussion

Various studies have shown that almost nine out of ten women dropout of the continuum of care for MHC (24–26). The aim of this study was to contribute to the body of knowledge on the continuum of MHC by exploring the perspectives of both providers and clients on the reasons why women dropout along the path of MHC.

We identified three thematic categories of reasons for women dropping out along the continuum of MHC. These include health system factors, community-level factors, and individual-level factors. The findings of the this study are partially in agreement with the findings of the study conducted in Assosa Zone, Benishangul Gumuz, and Northwest Ethiopia, which found socioeconomic, knowledge of maternal health maternal health services, poor roads, poor health facility readiness, lack of ambulances, cultural and traditional beliefs, providers being male, women's education level, urban residence, media exposure, perceived time to reach health facilities, and unprofessional behaviors as the major barriers to the maternal health service uptake (27, 28).

The identified factors in this study also concur with other studies in sub-Saharan Africa and have provided further insights into the barriers to the continuation of MHC. These barriers include health system level factors (erroneous concepts of responsibility and accountability, high staff turnover, poor communication), sociocultural (*"Michii" and "Gaaddidduu"),* Individual level factors (miss interpretation of concepts (COVID_19, "Rakkoon hin jiru"), knowledge about gestational age, late booking for ANC, dishonesty, *…kanaaf soba filanne,* the 59 principles), and the indirect cost of maternal and child health services, which are often not covered in national level intervention strategies and programmatic actions.

This study also showed high staff turnover, which may be connected with the lack of electricity and other infrastructure. Poor or absence of infrastructure affects the recruitment and retention of qualified health personnel in the communities. This, in turn, indirectly affects access to significant MHC, particularly in rural areas where health care systems are

challenged by fresh health care providers, leading to women dropping out from attending healthcare services and seeking care from inexperienced providers (29).

The Ethiopian government has also subsidized MCH services to make them affordable and available. Despite this initiative, this study showed that the indirect cost for MHC is by far higher than the direct cost, limiting women's access to these services and their continuation.

Given that healthcare facilities are less equipped with the necessary skilled manpower and equipment, clients' experiences at the facilities might not be positive. In addition, the low incentive system for healthcare workers in rural, remote areas will not motivate them to satisfy the needs of mothers coming for delivery. This is especially critical as healthcare workers are also expected to attend large number of deliveries, especially at night and on weekends. The poor referral system also creates further burden on women, especially in the context of the poor transport infrastructure. The transportation conditions usually worsen during the rainy season and at nights as transport providers hike their tariffs beyond what most members of the community can afford, which is an unexpected indirect cost that may also contribute to the dropout from the continuum of care. For instance, if the ambulance is unavailable, pregnant women are conveyed by inappropriate transport like commercial motorbikes, which may exacerbate their already deprived health conditions. Delays in getting pregnant women to the referral facility sometimes lead to fatalities and near-misses. This condition [fatalities and near-misses] may be used to confirm sociocultural views like "Michii" in the community. Hence, in addition to posing discomforts and additional economic burdens, the health care seeking process, especially for labor and delivery within the context of such poor infrastructure, is burden some. In addition, the entire system, both in healthcare and beyond, is not addressing the cultural, physical, and psychological needs of rural women.

In general, this study found that the continuum of care is influenced by complex factors both within and outside the health sector, which have a negative impact on the family's and the country's health and health care costs. However, there are some limitations to this study. The findings cannot be generalized because they are based on qualitative data. There

may be social acceptance bias, in which participants respond in a way that they believe will be more accepted. Additionally, this study solely examines scenarios in primary care institutions; there was no facility observation, and the study's scope does not include system limitations in referral and teaching hospitals.

Conclusions and recommendations

The reasons why women drop out from MHC are related to health system, community-level, and individual-level factors. This necessitates the preparation of care and robust health systems. In addition, addressing infrastructure related barriers is crucial. Within the healthcare system, implementing initiatives to improve the system, client-side barriers, and provider's side barriers such as staff shortages, motivation, supplies, logistics, and health facility capacity are essential. Creating habitable conditions and enabling environments for health care providers and implementing an evidence-based, culturally responsive health care system are critical to reducing this dropout. Furthermore, we recommend more large-scale studies to dig out more context specific barriers.

List of abbreviations

Antenatal care [ANC], Institutional Review Board [IRB], Maternal Health Care [MHC], Low and Middle-Income Countries [LMICs], Postnatal care [PNC], Skill birth attendance [SBA], Sustainable Development Goals [SDGs], World Health Organization [WHO]

Declarations

Ethics approval and consent to participate: This study was reviewed and approved by the Jimma University Institutional Review Board, and subjects provided informed consent prior to participation. All methods were performed in accordance with the medical research ethical standards that promote and ensure respect for all subjects and protect their health and rights.

Consent for publication: Not applicable.

Availability of data and materials

The datasets generated and analyzed during the current study are not publicly available but are available from the corresponding author on reasonable request.

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Authors' contributions

SB, GTF, MA, Protocol development. SB, methodology, formal analysis, manuscript preparation, and all authors read, commented the method, analysis and approved the final manuscript.

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Chapter Seven: Article IV

Continuum of maternal healthcare completion and its effect on birth outcomes in Southwest Ethiopia: a prospective follow-up study

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Abstract

Background: Pregnancy is generally enjoyable for most women and families. However, for those with adverse birth outcomes, it can be a time of worry and anxiety. Despite several interventions in Ethiopia, some adverse birth outcomes are rising. Understanding the effect of the continuum of care completion on birth outcomes is essential to putting evidence-based interventions in place.

Objective: The purpose of this study is to investigate the effect of the continuum of care completion on birth outcomes in Jimma Zone, Southwest Ethiopia.

Methods: A community-based follow-up study was conducted among pregnant women in selected woredas. Follow-up continued from pregnancy up to 42 days postpartum. A pre-tested interviewer-administered questionnaire used to collecte the data. Analyzed using Stata version 14. Descriptive statistics, multivariate logistic regression, and propensity score matching (PSM) model was fitted to see the effect CCoC on birth outcomes. Statistical significance was declared at a p-value less than 0.05 and AOR with a 95% CI.

Results: The completion of the continuum of care for maternal healthcare and adverse birth outcomes were 16.1% and 7.2%, respectively. Being a spouse of a partner who has attended formal education (AOR: 3.73, 95% CI: 1.65, 8.42), being a spouse of a partner who is a public employee (AOR: 5.33, 95% CI: 1.03, 27.53), a small family size (AOR: 6.40, 95% CI: 2.48, 16.51), grand multiparous (AOR: 0.18, 95% CI: 0.07, 0.44), receiving complete service during service contacts (AOR: 3.08, 95% CI: 1.75, 5.40), receiving advice during the service contacts (AOR: 4.67, 95% CI: 1.10, 19.92), and having social support (AOR: 2.05, 95% CI: 1.18, 3.56) were found to be statistically significantly associated with favorable birth outcome.

Conclusions and recommendations: Remarkable proportions of pregnancies end with adverse birth outcomes. Continuum of care completion is not statistically significantly associated with it. They're linked to factors like partners' education and employment, comprehensive services, family size, and social support. Hence, along with frequency of contacts, attention to comprehensiviness services is needed to improve the quality of care and integration with other sectors. Furthermore, further study with a large sample size is warranted to determine factors associated with each adverse birth outcome.

Keywords: Antenatal, Adveser birth outcomes, Jimma Zone, Ethiopia

Introduction

Pregnancy is generally a joyful time for most women and their families. However, for some, especially those who have experienced adverse birth outcomes (ABOs), it can be a period of worry and anxiety (1). ABO is a situation that any pregnant woman would not want to experience, and there are numerous indices of these adverse birth outcomes, which include stillbirth, preterm birth, low birth weight, small for gestational age (SGA), macrosomia, neonatal death, and congenital anomalies (2, 3).

It is among the predictors of public health and an indicator of progress towards the Sustainable Development Goals (SDGs) in developing countries (4). The global target is to lessen unfavorable birth outcomes by 2030 (5, 6). For instance, the global target for stillbirth is 12 or fewer per 1000 live births by 2030 (6, 7), but low and middle-income countries (LMICs) like southern Asia and Sub-Saharan Africa have experienced slow declines over the past 15 years, and the projected rate of stillbirth ranges from 21.3 to 56.9 per 1,000 births (7–9).

Preterm birth is defined as delivery happening before 37 weeks of gestation, and it is a leading cause of neonatal fatalities, disabilities, and ill health, accounting for 35% of all deaths worldwide (10). Reducing preterm births requires national commitment and the successful implementation of existing interventions (11). Low birth weight (LBW) is defined by the WHO as less than 2,500 grams (12), affecting 20% of infants globally and leading to neonatal death and childhood mortality (13, 14).

Studies have shown ABO is influenced by biological, psychosocial, and environmental factors, including low pre-pregnancy BMI, weight gain, prenatal care utilization, the female fetus, anxiety, depressive symptoms, socioeconomic status, maternal education, smoking history, marital status, pregnancy desire, teenage pregnancy, maternal comorbidities, and genetic vulnerabilities (2, 15–19). Reducing ABO is essential to reducing under-five mortality globally (11), and evidence shows that implementing a number of low-cost interventions, including high-quality maternal healthcare, could have a positive effect on adverse birth outcomes (10, 20). The continuum of care was believed to be a fundamental principle and a unifying call to reduce the yearly toll of millions of maternal, neonatal, and child deaths through early screening, management, and prevention of complications (21–24).

ANC is used for early detection, management, and prevention of pregnancy complications, ensuring a healthy newborn (21). However, different studies reported different results on the effects of the time of ANC intake, the contents of the service, and the frequency of contacts on maternal and child health (25–27).

According to data from Demographic Health Surveys (DHS) conducted in 18 LMICs, having four or more ANC consultations and the timing of these consultations decreased the odds of LBW (14). However, a retrospective cohort study and meta-analysis found that gestational age at first ANC contact has no effect on stillbirths in isolation (28) but receiving care from antenatal to postnatal care has linkages for reducing combined risks of neonatal, perinatal, and maternal mortality by 15% in low- and middle-income countries (29).

Another systematic review and meta-analysis showed that continuous care during pre-pregnancy and pregnancy periods may lower the incidence of newborn neonatal and perinatal mortality risks by 21% and 16%, respectively (30). A study also found that complete care from the antenatal to postnatal phases can lower infant mortality by 36 to 67% (31).

A systematic review and meta-analysis in Ethiopia reported that the overall pooled prevalences of adverse fetal outcomes in Ethiopia was 26.88% (2). A few earlier studies in Ethiopia revealed various prevalence of unfavorable birth outcomes. For instance, a study from North Wollo, Northeast Ethiopia, reported 31.8% (32). The study from Gondar University Hospital in Northwest Ethiopia reported a rate of 23% (33), while the one from Hawassa Town Governmental Health Institutions in South Ethiopia reported a rate of 18.3% (34) and ANC follow-up, history of ABOs and residency, ANC follow-up, pregnancy-induced hypertension, maternal age, chronic disease(s), pregnancy complications, previous history of ABO, presence of a cat in the house, knowledge of preconception care, and twin pregnancy were predictors (2, 32–36).

WHO recognized the synergy among antenatal, facility delivery, and postnatal care and used it as a globally recommended method to prevent and/or reduce adverse outcomes (37, 38). The Federal Democratic Republic of Ethiopia Ministry of Health also accepted and has been implementing this suggestion since then. However, some studies have shown

a lack of evidence on the effect of time of initiation and frequency of ANC contact on birth outcomes (27, 28), a rarity of evidence to support the impact of the continuum of care on birth outcomes. Therefore, the purpose of this study is to investigate the effect of the continuum of care completion on birth outcomes in Southwest Ethiopia.

Methods and Materials

A community-based prospective follow-up study among pregnant women up to 42 days postpartum was conducted in Jimma Zone from July 2020 to June 2021. Jimma Zone is one of the 21 Zones of Oromia Regional State, which is located 350 kilometers from the capital Addis Ababa in the southwest of Ethiopia.

According to the 2021 Jimma Zonal annual report of the Zonal Health Desk, the zone consists of 20 rural districts and two town administrations, with 42 urban and 513 rural kebeles, for a total of 3.5 million people. Of which 50.1% are men and 49.9% are women, and 23.1% of the women are in reproductive age. The provision of medical services in the zone is carried out through one tertiary hospital, three general hospitals, five primary hospitals, 122 health centers, and 556 health posts. The zone also has 3327 all type health professionals, except those working at tertiary hospital and 1136 health extension workers (39, 40).

Study population and sampling techniques

Pregnant women in the randomly selected districts of the zone who fulfill the inclusion criteria were the study population, and pregnant women with a gestational age of less than or equal to 26 weeks, at least one birth history, residency in the selected woredas, and who received their first ANC during enrollment were enrolled in the study.

The sample size used for this study was calculated using Epi-Info V. 7.2.4.0 statCalc and for two sample proportion comparisons based on the following assumptions: Alpha of 0.05 (95% CI), Power of 0.8, the ratio of unexposed (those with incomplete CoC for MHC) to exposed (those with completed CoC for MHC) groups of 23.44, the probability of event (birth outcomes) in the non-exposed group of 25.78%, and the probability of event (birth outcomes) in the exposed group of 1.1% (41), and a design effect of two.

Finally, 10% was added to account for non-responses and loss to follow-up, and the final sample size was 1065. A multistage-clustered sampling technique was used to identify a cohort of pregnant women enrolled in the follow-up study and followed for ANC, facility delivery, and PNC, from which birth outcomes are calculated.

Measurements

The dependent variable for this study was the presence of the birth outcome. It was categorized as absent when it was free of preterm birth, stillbirth, LBW, and neonatal death within the first 42 days; otherwise, it was categorized as present. The independent variables were sociodemographic, wealth index, birth order, previous experience, birth history, experience of maternal health care utilization, time of ANC booking, times of ANC contact, service and advice given during maternal health care utilization, place of care, and social support.

The tool for data collection was adapted from various sources. The wealth index indicators were adapted from the Ethiopian Demographic and Health Survey (EDHS) (42). Indicators to measure person-centered maternity care were adapted from the validated tool to measure person-centered maternity care in developing settings (43). Indicators for maternal care practices were adapted from the World Health Organization (WHO) packages (44). Data on the determinants of maternal health service utilization were collected using a structured questionnaire adapted from different literature (42, 44–48). All the questionnaires were prepared in English, then translated into 'Afan Oromo' and used to collect the data after being back translated to English by experts to ensure consistency. Data were collected at three time points (Phase I, Phase II, and Phase III) by health care providers' using pre-tested interviewer administered structured questionnaires adapted from various literature.

Data collection process

A house-to-house visit was used to enumerate pregnant women in the 45 Kebeles catchments. Then, as a cohort, all the identified pregnant women were enrolled in the study. Data on basic socio-demographic, economic, previous obstetric history, experience of maternal health care use, knowledge of maternal health care, services and advice given

at or during a previous pregnancy, and services and advice given at or during the first ANC of a current pregnancy are collected at this stage (the first phase).

At Phase II (follow-up): At three months (at Visit 4: 36 to 38 weeks) after the baseline (Phase I), the mothers were followed for completion of their ANC, and at 10 weeks after the second Phase II of follow-up, the Phase III of the study was carried out to assess the maternal care (facility delivery and PNC) practices, birth outcomes, access to maternal healthcare, women-centered maternity care, decision making autonomy, and social support. In order to avoid measurement bias, the study hypothesis was kept blind from the data collectors. To maintain standard data collection procedures, the data collectors were trained for one day on the study instrument and data collection procedure, which included the relevance of the study, the objective of the study, the confidentiality of the information, informed consent, and interview technique. The data collectors worked under close supervision to ensure adherence to the correct data collection procedures. There were debriefing sessions with the principal investigators, supervisors, and data collectors to solve the challenges as early as possible and take corrective measures accordingly. Quality assurance techniques for qualitative study also used. Moreover, to ensure data quality, the data were carefully entered and cleaned before the beginning of the analysis.

Data management and analysis

Data were checked for completeness and consistency; the collected data were coded and entered into Epidata V.4.6.0.2 to minimize logical errors and maintain skipping patterns. The data were then cleaned, edited, and exported into Stata version 14 for analysis. Descriptive analysis was done by computing proportions and summary statistics to indicate a summary of the variables. In addition, the socioeconomic index, time and times of ANC contact, service and advice given during maternal health care utilization, and social support were computed by composite indicators based on the operational definitions.

To examine the relationships between the dependent and independent variables, bivariate analysis was used. To increase the number of candidate variables for the final model, all variables with P-values less than 0.25 were considered. A statistically significant association

was declared in multivariate logistic regression with a p-value less than 0.05 to determine factors associated with continuum of care completion and an adjusted odds ratio with a 95% CI. Finally, propensity score matching was fit to estimate the effect of a continuum of care completion and birth outcome.

Ethical Considerations

Ethical approval was obtained from Jimma University, Health Institute, Institutional Review Board (IRB) dated November 27, 2019 with Reference No. IHRPGD/433/2019. Similarly, administrative clearance was obtained from the zone and selected woredas health offices. An information sheet addressing the objectives of the study and the benefits and harms was given to each study participant. Each respondent provided written informed consent prior to the actual data collection, and participation in the study was entirely voluntary. Participants who were unable to read the informed consent had their consent obtained by having the data collectors read it to them line by line. The participant was given the freedom to leave the interview at any time. Data collectors were instructed to ensure confidentiality, give pertinent health information based on participant needs, and arrange referrals to medical facilities for mothers who had problems in order to prevent any complications.

Results

Socio-demographic and economic characteristics

The pregnant women were followed for maternal healthcare use and birth outcomes. Of the total 987 women included in the analysis (**Fig. 2,** paper II), almost all 928 (94.0%) of them were less than 35 years old. A larger portion, 788 (79.8%) of them, were from rural residences. More than one third, 353 (35.8%), of the mothers didn't attend formal education. Two-thirds (674, or 68.3%) of them were housewives by occupation. Similarly, more than two-thirds (673, or 69.2%) of their partners were farmers by occupation. Almost all 919 (94.5%) of them were in monogamous marriages. One third (321, or 32.5%) of them were from small family sizes, and 680 (68.9%) of them were from low economic status categories **(Table 12)**.

Table 12: Distribution of the study participants by their socio-demographic and economic characteristics, July 2020 to June 2021, Jimma Zone, Southwest Ethiopia

Variable	Category	Frequency	%
Age	Less than 35	928	94.0
	Equal to or greater than 35	59	6.0
Residence	Semi urban	199	20.2
	Rural	788	79.8
Educational status of the pregnant women	No formal education	353	35.8
	Primary (1 to 4)	201	20.4
	Primary second cycle (5 to 8)	226	22.9
	Secondary and above	207	21.0
Educational status of the partner	No formal education	267	27.4
	Primary (1 to 4)	177	18.2
	Primary second cycle (5 to 8)	250	25.7
	Secondary	144	14.8
	College and above	135	13.9
Occupation of pregnant women	Housewife	674	68.3
	Gov't employee	129	13.1
	Merchant	112	11.4
	Other*	72	7.3
Occupation of the Partner	Farmer	673	69.2
	Gov't employee	166	17.1
	Other**	134	13.8
Type of Marriage	Monogamy	919	94.5
	Polygamy	54	5.5
Family size	Small	321	32.5
	Medium	509	51.6
	Large	157	15.9
Wealth Index	Low	332	33.6
	Middle	324	32.8
	High	331	33.5

Other = has no regular occupation, student, self-employed, merchant, other **=deriver, no regular occupation, sheki, self-employed*

Maternal healthcare utilization and complications

Among the participants, 102 (10.3%) and 169 (17.1%) had complications during the index pregnancy and delivery, respectively. The majority of 724 (73.4%) of the women had their ANC first at health centers; 754 (76.4%) of them were late in booking for ANC; 391 (39.6%) of them had four or more ANC contacts; and 58.3% (228/391) were from the late bookers. Only 36 (3.6%) of them reported having complications during their current pregnancy. Most (778, or 78.8%) of them were multiparous women, and 363 (36.8%) had an interpregnancy interval of two or less than 24 months. In terms of where they gave birth, 144 (14.6%) of them did it at home. Fewer than one third (29.55%) of them reported not receiving social support, whereas 231 (23.4%) had incomplete care during the recent ANC and 218 (22.1%) experienced complications during the current delivery **(Table 13).**

Table 13: Distribution of the study participants by their maternal complications and healthcare utilization, July 2020 to June 2021, Jimma Zone, Southwest Ethiopia

Variable	Category	Frequency	%
Parity	Multiparity (≤4 births)	778	78.8
	Grand multiparity (≥5 births)	209	21.2
Past completion of MHC	Not Completed	850	86.1
	Completed	137	13.9
Complications during the last pregnancy	No	885	89.7
	Yes	102	10.3
Maternal complications during past delivery	Not	818	82.9
	Had	169	17.1
Birth space	2 years or less	363	36.8
	More than 2 years	624	63.2
Where did you received ANC first	Health Post	101	10.2
	Health Center	724	73.4
	Hospital	162	16.4
Time of booking for the ANC	Early booking	233	23.6
	Late Booking	754	76.4
Times had ANC	One times	64	6.5
	Two times	263	26.6
	Three	269	27.3
	Four or more times	391	39.6
Had 4 or more ANC visits	No	596	60.4
	Yes	391	39.6
Time and times of the ANC	Late booking and less than ANC4	526	53.3
	Late booking and ANC4 or more	228	23.1
	Early booking and ANC4 or more	163	16.5
	Early booking and less than ANC4	70	7.1
Complications during the current pregnancy	Had	36	3.6
	Not had	951	96.4
Place of delivery	Home	144	14.6
	Health facility	843	85.4
Mode of delivery (N= 843)	SVD	800	94.9
	Caesarean section	43	5.1
Complications during the current delivery	No	769	77.9
	Yes	218	22.1
Services given during the current ANC	Complete	231	23.4
	Incomplete	756	76.6
Advice given during the current pregnancy	Complete	886	89.8
	Incomplete	101	10.2

① *Early booking of ANC: When pregnant women arrived at a healthcare facility before 16 weeks of gestation, otherwise late booking* (50)

Person-centered maternity care, Social support, and Decision making

A study investigated how women experiencing maternity care felt about being respected, involved in decisions, and supported. While most 560 (56.7%) women reported that they were not treated with respect and dignity, 660 (66.9%) felt that communication and decision-making lacked autonomy. Despite this, over three-quarters (77.9%) perceived that they received supportive care. The overall PCMC was determined, and only 213 (21.6%) of them felt they received PCMC, which emphasizes respecting women's preferences and needs (Table 14).

Table 14: Distribution of the study participants by PCMC, Social support, and decision making on accessing MHC, July 2020 to June 2021, Jimma zone, Southwest Ethiopia.

Variable	Category	Frequency	%
Treatment with dignity and respect (n=987)	Treated with dignity and respect	392	39.7
	Not treated with dignity and respect	560	56.7
	Do not know	35	3.5
Treatment with communication and autonomy	Communicated and treated with autonomy	304	30.8
	Not communicated and treated with autonomy	660	66.9
	Do not know	23	2.3
Nature of care (n=893)	Supportive	696	77.9
	Not supportive	177	19.8
	Do not know	20	2.2
Trust in care providers (n=987)	Trust	908	92.0
	Not trust	69	7.0
	Do not know	10	1.0
Facility organization (n=929)	Good	294	31.6
	Not good	604	65.0
	Do not know	31	3.3
Overall PCMC	Treated with PCMC	213	21.6
	Not treated with PCMC	748	75.8
	Do not know	26	2.6
Social support	Had	696	70.5
	Not had	291	29.5
Decision making in MNCH	Joint	928	94.0
	Other	59	6.0

Completion of the continuum of care for maternal healthcare

The continuum of care for MHC and birth outcomes was monitored for a total of 1065 pregnant women who had their first ANC at the time of recruitment. Of those 987 included in the analysis, 391 (39.6%) of them continued to have four or more ANC contacts. Of those who had four or more ANC contacts, 92.6% (362/391) gave birth in a health facility. Among, those who had four or more ANC contacts and gave birth in a health facility, 56.1% (203/359) failed to receive their PNC. The overall completion of the CoC for MHC was found to be 16.1% (159/987). (Details: **Paper II, Fig. 7**)

Birth outcome

The birth outcome was measured in terms of preterm, stillbirth, LBW, and early neonatal death and further categorized into adverse birth outcomes when the birth was preterm, stillbirth, LBW, or neonatal death within the first 42 days; otherwise, no adverse birth outcome. Of the total adverse birth outcomes, LBW was the most frequent, 34 (47.9%), and the overall adverse birth outcome was 7.2% (95% CI, 5.7%, 8.8%) and the Relative Risk (RR) is 0.245, indicating that 24.5% of the exposed group (14 out of 71) experienced the event compared to the unexposed group(**Table 15**).

Table 15: Distribution of the study participants by their birth outcomes Jimma zone, Ethiopia, July 2020 to June 2021, Jimma zone, Southwest Ethiopia

Variable and its category		Birth outcomes										Total	
		Preterm birth		Still birth		LBW		Neonatal death		Combination			
		Fre	%	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%
COC	Completed	4	5.6	1	1.4	5	7	0	0	4	5.6	14	19.7
	Not completed	6	8.5	8	11.3	29	40.8	4	5.6	10	14.1	57	80.3
	Total	10	14.1	9	12.7	34	47.9	4	5.6	14	19.7	71	100
	RR	14/57											24.5

Overall birth outcome (n = 987)	Unfavorable/Negative		Favorable/Positive	
	Fre	%	Fre	%
	71	7.2	916	92.8

Completion of the continuum of care for MHC and birth outcomes

Bivariate analysis reveals that, from socio-demographic and economic variables, educational status of both partners, occupational status of partners, family size, obstetrics and maternal healthcare factors such as parity, history of past obstetric experience, time of booking for ANC, times of ANC contacts, complications during current pregnancy and delivery, services and guidance during ANC contacts, and social support were statistically significantly associated with birth outcomes ($p < 0.25$) (**Table 16**).

Conversely, maternal age, residence, wealth index, PNC utilization, birth interval, previous experience of bad obstetrics, place of delivery, treatment with dignity and respect, communication and treatment with autonomy, nature of care, and completion of the CoC for MHC were statistically not associated with birth outcomes ($p < 0.25$). However, multivariate logistic regression analysis was used to determine the factors that would most likely influence birth outcomes. The educational status of the partner, occupation status of the partner, family size, parity, level of completeness of the services and advice given during the ANC contacts, and having social support continued to be statistically significantly associated with birth outcomes. Women with partners who have attended any form of formal education were more likely to have favorable birth outcomes compared to women whose partners had not attended any formal education. When compared to women whose partners had no formal education, women with partners with primary education were almost four times (AOR: 3.73, 95% CI: 1.65, 8.42) more likely to have a favorable birth outcome. Women whose partners are public employees were almost five times (AOR: 5.33, 95% CI: 1.03, 27.53) more likely to have favorable birth outcomes compared to women whose partners were farmers. Women with small families were nearly six times (AOR: 6.40, 95% CI: 2.48, 16.51) more likely to have favorable birth outcomes compared to those with large families.

Similarly, multiparity (≤4 births) decreases the likelihood of favorable birth outcomes by 82% (AOR: 0.18, 95% CI: 0.07, 0.44) compared with grand multiparity (≥5 births). Those who did not obtain the recommended ANC service packages and advice during the ANC contacts were three and five times (AOR: 3.08, 95% CI: 1.75, 5.40, and AOR: 4.67, 95%

CI: 1.10, 19.92) more likely to have a favorable birth outcome compared with women who did not have the recommended ANC service packages and advice during the ANC contacts, respectively. Women who had social support were two times (AOR: 2.05, 95% CI: 1.18, 3.56) more likely to have a favorable birth outcome compared with women who had no social support (p 0.05) (**Table 16**)

Table 16: Binary and multivariate logistic regression of factors associated with birth outcomes, July 2020 to June 2021, Jimma zone, Southwest Ethiopia

	Category	Odds Ratio (95% CI)					
		Crude			Adjusted		
Educational status of the pregnant women	No formal education			1			
	Primary	2.51	1.23	5.13			
	Primary, second cycle	2.57	1.29	5.11			
	Secondary and above	2.89	1.38	6.08			
Educational status of the partner	No formal education			1			
	Primary	2.72	1.27	5.83	3.73	1.65	8.42*
	Primary, second cycle	2.46	1.29	4.70	2.81	1.39	5.71*
	Secondary and above	2.48	1.12	5.51	3.02	1.15	7.90**
	College and above	3.79	1.45	9.94	3.77	.93	15.27
Occupation of pregnant women	Housewife			1			
	Gov't employee	1.64	.69	3.92			
	Merchant	1.42	.59	3.38			
	Other**	.56	.26	1.19			
Occupation of the partner	Farmer			1			
	Gov't employee	3.53	1.26	9.89	5.33	1.03	27.53**
	Other***	.89	.46	1.71	1.00	.36	2.82
Family size	Small	2.81	1.39	5.69	6.40	2.48	16.51*
	Medium	1.76	.98	3.15	4.07	1.85	8.96*
	Large			1			
Parity	Multiparity			1			
	Grand multiparity	.59	.29	1.17	.18	.07	.44*
Time of booking for ANC (current)	Early booking	1.56	.83	2.96			
	Late booking			1			
Time and times of the ANC	Late booking & less than ANC4			1			
	Late booking & ANC4 & more	1.95	.90	4.20			
	Early booking & less than ANC4	1.66	.58	4.74			
	Early booking & ANC4 or more	1.98	1.01	3.89			
Complications during the current pregnancy	Not had	2.16	.81	5.75			
	Had			1			
Complications during the current delivery	Not had	1.90	1.13	3.19			
	Had			1			
Services given during the current ANC	Incomplete			1			
	Complete	2.60	1.58	4.27	3.08	1.75	5.40*
Advice given during the current ANC	Incomplete			1			
	Complete	4.18	1.01	17.32	4.67	1.10	19.92**
Social support	Not			1			
	Had	1.72	1.05	2.83	2.05	1.18	3.56**

**Statically significant at p<0.01, ** statically significant at p<0.05*

Effects of the maternal healthcare continuum of care completion on birth outcomes

A propensity score matching (PSM) model was used to minimize the confounding effect of covariates when estimating the treatment effect on the outcome variable. The nearest neighbor matching, which is one of the five different approaches of PSM, was used to estimate the effects of the completion of a continuum of maternal health care on birth outcomes.

After matching treated and controlled individuals, there was no statistically significant difference in birth outcome between women who completed the continuum of care for maternal healthcare through the time and maternal healthcare dimension and those who discontinued maternal health services.

Even though the average treatment effect (ATE) of completion of the continuum of care for maternal healthcare decreases the odds of adverse birth outcomes by 3% and 1% via past and current time dimensions and the maternal healthcare dimension (β=-0.03; 95% CI: 0.06, 0.01), (β=-0.01; 95% CI: 0.05, 0.03) and (β=-0.01; 95% CI:.05,.03), respectively but it has no statistically significant effect on birth outcome. This means the benefits to be gained by completing the continuum of care for maternal healthcare services were not statistically significant in this study (**Table 17**).

Table 17: Effect of completion of COC for maternal healthcare services on birth outcomes: Propensity score matching analysis, July 2020 to June 2021, Jimma zone, Southwest Ethiopia

Variables and their categories		Birth outcome		ATE		ATET	
		Favorable	Unfavorable	β 95% CI	P	β 95% CI	P
Past CoC in MHC through the time dimension							
Past ANC use	Had	681(92.9)	52(7.1)	-.02(.06,.01)	0.20	-.01(.05, .03)	0.67
	No	235(92.5)	19(7.5)				
Place of past	Home	204(93.2)	15(6.8)	-.02 (.06,.01)	0.18	-.01(.05, .03)	0.58
delivery	Health facility	712(92.7)	56(7.3)				
Past PNC use	Yes	139(92.1)	12(7.9)	-.01(.05,.04)	0.89	-.02(.07, .02)	0.33
	No	777(92.9)	59(7.1)				
Past CCoC via	Dropped	788(92.7)	62(7.3)	-.03(.06,.01)	0.17	-.02(.07, .03)	0.52
time dimension	Completed	128(93.4)	9(6.6)				
Current CoC in MHC through the time dimension							
Time of booking	Late Booking	695(92.2)	59(7.8)	-.01 (.05,.03)	0.61	-.01 (.05,.03)	0.64
for the ANC	Early Booking	221)94.8)	12(5.2)				
Had 4 or more	Yes	366(93.6)	25(6.4)	-.01(.05,.03)	0.66	-.01(.05,.04)	0.94
ANC contacts	No	550(92.3)	46(7.7)				
Place of delivery	Home	134(93.1)	10(6.9)	-.01(.05.03)	0.61	-.01(.05,.03)	0.59
	Health facility	782(92.8)	61(7.2)				
PNC(Immediate)	Yes	798(92.6)	64(7.4)	-01(.05,.03)	60	-01(.06,.03)	0.52
	No	118(94.4)	7(5.6)				
Current CCoC via	Dropped	190(93.6)	13(6.4)	-01(.05,.03)	0.65	-01(.05,.04)	0.92
time dimension	Completed	149(93.7)	10(6.3)				
Current CoC via maternal healthcare services							
Services given	Complete	201(87.0)	30(13.0)	-.02(.05,.02)	0.45	-.01(.06,.03)	0.51
during the ANC	Incomplete	715(94.6)	41(5.4)				
Advice given	Complete	817(92.2)	69(7.8)	-.01 (.05,.04)	0.72	-.01 (.05,.03)	0.69
during the ANC	Incomplete	99(98.0)	2(2)				
Current CCoC via	Dropped	767(92.6)	61(7.4)	-01(.05,.03)	0.52	-01(.05,.03)	0.55
space dimension	Completed	149(93.7)	10(6.3)				

ATE: Average treatment effect, ATET: Average treatment effect on the treated

Discussion

Adverse (unfavorable) birth outcomes were expected to remain a big challenge for low- and middle-income countries. This study was aimed at examining the determinants of adverse birth outcomes, and the overall ABO was 7.2% (95% CI, 5.7, 8.8) and the Relative Risk (RR) is 24.5%.

This finding was by far lower than the findings reported in different parts of the country. A systematic review and meta-analysis in Ethiopia reported that the pooled prevalence of adverse fetal outcomes was 26.88% (2), the study in Gondar University Hospital, reported 23% (33), the study in the North Wollo zone; reported 31.8% (32) ,study at Hawassa town governmental health institutions reported 18.3% (34) and the study in Bale zone hospitals reported 21% (36).

Though the improvement is not satisfactory, this is expected and could be attributed to the increasing expansion of maternal health services over time, the current ministry of health, greater attention for maternal and child health services, and variations in the study settings. Also, most of the studies cited above were conducted at the level of health facilities, where mothers frequently go when they experience complications that may be the cause of the increase in the proportions of adverse birth outcomes, and in the Amhara region, the region that hosts the largest share of child brides that contribute to complications during childbirth and the birth outcomes (49, 50). Additionally, the operational definitions used in some of the studies included stillbirth, preterm birth, low birth weight, small for gestational age, neonatal death, and congenital anomalies, whereas only preterm birth, stillbirth, low birth weight, and neonatal death within the first 42 days were used in this study.

Utilizing maternal health services offers opportunities for monitoring feto-maternal health and enabling prompt intervention for feto-maternal protection (53). The time of booking and the times of contacts are among the fundamental elements of the services; this enables mothers to receive full packages of maternal health services (21). Also, WHO recognized the synergy of antenatal, facility delivery, and postnatal care to prevent and or reduce adverse outcomes (25, 26) compared to fragmented care, as it ensures the mothers receive

the full packages of maternal services and early detection, management, and prevention of complications throughout the continuum of care (11, 43).

However, this study revealed that, statistically, there is no connection between maternal healthcare continuum completion and birth outcomes. This implies that what matters is not only the times of contact but also the quality of the service used for identification and management of obstetric complications that could contribute to birth outcomes, as early detection and prevention of complications are at the heart of the care (36, 55).

Furthermore, we cannot draw the conclusion that times of facility visits or completion alone is sufficient to prevent adverse birth outcomes. Birth outcomes are linked to collective interventions and complex multifactorial etiologies such as service quality, environmental exposures, and sociocultural factors like nutritional taboos. Nutritional taboos may deprive people from essential nutrients and exacerbate nutritional deficiencies, resulting in less maternal weight gain during pregnancy, which is reflective of poor fetal growth, parity, maternal age, gestational age, and culturally unacknowledged rest for pregnant women (56–58).

Also, a systematic review of the interventions to reduce preterm birth, stillbirth, and LBW in MLICs reported that there was no significant difference in birth outcomes among ANC users and non-users (11) and the evidence from 18 LMICs DHS reported that what matters is the quality of ANC services given during ANC contact rather than the frequency of ANC to prevent LBW (14).

Even though the timing and frequency of ANC check-ups have an independent effect on the content of the care to be provided for pregnant women, the skill and motivation of care providers are critical for providing the WHO recommended standards of care (59). This study also observed the other possible factors associated with birth outcomes, including the partner's education and occupation, family size, parity, completeness of the services and advice provided during the ANC contacts, and social support were found to be statistically associated with birth outcomes.

Women with partners with college or higher education are more likely to have favorable birth outcomes. This could be explained by the fact that educated partners have better opportunities to be informed about health benefits, learn about pregnancy challenges that help them early decide to access medical facilities, and are more likely to provide them with emotional support and promote their wives' quality of life. However, partners with limited education often hinder discussions about reproductive health, do not know where to take her for healthcare, and are not able to recognize symptoms of ill health in a timely manner and seek medical help, which contributes to poor birth outcomes.

Women's family size is among the predictors of birth outcomes. Women with fewer children are more likely to take care of themselves, be knowledgeable about pregnancy-related issues, have access to medical facilities, and make regular visits that aid in the early detection, management, and prevention of difficulties connected to pregnancy.

Moreover, in this study, receiving complete service and advice during the service contact is among the predictors of birth outcomes. The quality of the service leads to the early identification and management of obstetric complications. These contribute to better birth outcomes and a better continuum of maternal health care (55). To maintain the quality and comprehensiveness of services that improve pregnancy outcomes, the WHO adopted a new ANC model that recommends increasing the number of contacts from four visits to eight contacts (38). Along with increasing the number of visits, it is equally important to improve the quality of services and facilities for the early detection and treatment of childbirth related complications.

Generally, the findings of this study should be interpreted with the following constraints. Due to the insufficient count of cases, it was not possible to examine specific adverse birth outcomes separately with the time and times of ANC contacts. Furthermore, the study does not included adverse birth outcomes small for gestational age and congenital anomalies.

Conclusions and recommendations

Remarkable proportions of pregnancies end with adverse birth outcomes. The benefits gained by the completion of the continuum of maternal care in improving birth outcomes are not statistically significant.

Women whose partners had formal education and were public employees, received complete service and advice during the service contacts, being multiparous, having a small family size, and having social support were statistically significant factors that increased the likelihood of favorable birth outcomes. Hence, rather than only focusing on increasing the frequency of maternal healthcare contacts, it is paramount that the quality and completeness of the service should be improved to reduce unfavorable birth outcomes through the provision of tailored information and education, early identification, and management of the risk factors. Furthermore, a study with a large sample size is needed to capture information related to specific adverse birth outcomes and maternal healthcare utilization.

Declarations

Ethics clearance and participation consent: This study received ethical approval from the Jimma University Institutional Review Board. Before initiating the study, every participant gave their informed consent. The study adhered to medical research ethical standards that promote and ensuring respect for all participants and safeguarding their health and well-being.

Consent for publication: Not applicable.

Availability of data and materials

The data analyzed for this research is not publicly available. However, interested researchers can contact the corresponding author for data access requests.

Conflicting interests: The authors claim they have no conflicting interests.

Authors' contributions

SBK, GTF, MAW, protocol development. SBK, methodology, formal analysis, manuscript preparation, and all authors read, commented on, analysis and approved the final manuscript.

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List of abbreviations

ANC: Antenatal Care; DHS: Demographic Health Survey; IRB: Institutional Review Board; MCHC: Maternal Child Health Care; LMICs: Low and Middle-Income Countries; PCA: Principal Components Analysis; PNC: Postnatal Care; SBA: Skill Birth Attendance; SDGs: Sustainable Development Goals; SGA: Small for Gestational Age; SVD: spontaneous vaginal delivery; WHO: World Health Organization; Wks: weeks

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Chapter Eight: Discussion

The purpose of this thesis was to investigate the completion of the MHC continuum and birth outcomes in the context of primary health care in Jimma Zone. A combination of research designs were used. Scoping review to look in to and characterize available evidence on the continuum of MHC in LMICs; quantitative to investigate the completion status of the MHC continuum and the effect of completion on birth outcomes; and qualitative to gain rich insights into why women walk away from maternal health services. In this section, the key findings of the thesis, methodological issues, and ethical considerations are discussed.

8.1. General discussion of the main findings

The health of mothers during pregnancy, childbirth, and postpartum is crucial for society's overall well-being. Childbirth complications can have a long-term, detrimental impact on women's daily functioning and overall well-being, which can have repercussions for the country at large (100).

The continuum of care has been among the emphasized interventions to guarantee that women receive timely and appropriate services during pregnancy, childbirth, and postpartum to maintain their health (101, 102). It is essential and a proximal determinant of treatment compliance, like iron-folic acid supplementation, a reduction in maternal and child complications, morbidity, and better birth outcomes (1,28,43,67,103). However, in Ethiopia, the current maternal mortality is nearly six times the SDG target of reducing it to 70 by 2030 (32).

The main findings in this thesis were: a greater emphasis was placed on evaluating the proportion of the continuum of care completion from a care recipient's perspective rather than figuring out why women drop out; the effect of completion on birth outcomes (Paper I); the maternal healthcare continuum in the Jimma zone is underdeveloped, as indicated by a low completion rate (Paper II), and the occurrence of adverse birth outcomes was

remarkable (Paper IV). These issues could be discussed in relation to individual, community, and health system level factors (Papers II and III).

Evidence showed that prior experience with maternal health services determined subsequent utilization (68). In paradox to this, women who attended ANC did not give birth in health facilities and received PNC, as well as those who gave birth in health facilities but failed to receive PNC, and the completion of the continuum of MHC in this study is 16.1% (Paper II). This indicates that much needs to be done to improve the completion rate, where less than one out of five pregnant women who stated ANC reached PNC across the continuum of care. A notable dropout was observed between the first ANC contact and four or more ANC contacts, followed by facility delivery and postnatal care, where many mothers fail to attend the recommended ANC and PNC after receiving one ANC and facility delivery (paper II).

This finding is higher than the findings of the studies reported in Cambodia,5% (41), Tanzania,10% (13),Ghana,8.0% (42), and some parts of Ethiopia: Arbaminch Zuria district,9.7% (12), West Gojam Zone 12.1% (44), and the evidence generated from EDHS 2016, 9.1%, and, 6.56% respectively (104, 105)

Although the improvement is expected but not satisfactory, this discrepancy may be attributed to the increasing expansion of health services over time, connected with the greater attention paid to MNCH services from the ministry's side and the health system at large. Also, variation in policy and regulation, the study design, the proportion of mothers who received the service, the study methodology, geographical variation, and the criteria used to measure the completion of maternal healthcare. Perhaps the time gap has contributed to the change in women's knowledge regarding maternal healthcare. In the present study, for example, 91.6% and 63.3% of the women knew about SBA and ANC, respectively, and the presence of a variation in professional skills among care providers may contribute to the resultant discordance. For instance, the studies from Cambodia, Tanzania, Ghana, and parts of Ethiopia were based on the country's DHS, which is prone to recall bias due to retrospective data relying on memory of a past event, being cross-

sectional by design, and having demand characteristics where participants may over-report their utilization to please the researcher.

However, this finding was lower than what was reported in Egypt, 50.4% (43), Northwest Ethiopia; Motta town and Hulet Eji Enese district, 47% (46), Enemay District, 45% (2),Gondar Zuria and Dabat districts, 21.6% (47), Debre Berhan Town, 37.2% (48) and Nigeria, 18.7% (49)

In light of the fact that the study was conducted during the COVID-19 era, COVID-19 has been recognized as one of the obstacles to MHC use by interrupting pregnant women's mobilization through house-to-house visits, pregnant women's forums, and changes to the cost and regulation of transportation. This inconsistency may also be attributed to contemporaneous changes linked to the COVID-19 epidemic, despite the greater attention that the ministry has given to MNCHC than it has in the past. Also, because this study was a follow-up study, it may have reduced the probability that individuals who dropped out of the study would over-report their usage to please the researcher, which is unusual in cross-sectional studies.

Also, the first ANC contact is a critical entry point for women. According to this study, 73.4% of women had their first ANC contact at health centers. It may be that health centers lack the infrastructure required to provide comprehensive and quality care, which leads women to fail to complete the CoC as a result of unfulfilled care demands. In addition, 76.4% of them made late bookings, 23.4% said they had an incomplete service package, and merely 21.6% of the women thought they had PCMC, a low degree of perceived PCMC, which could have contributed to low completion.

This study also tried to identify the facilitators and barriers that caused more than four out of five women to drop out of the MHC continuum (Papers II and III). Accordingly, these facilitators and barriers could be summarized as trichotomic factors that can be divided up among the community (care receivers), care providers, and the health system at large. Poor connection among these results in the provision of a suboptimal service, low-quality care,

an unfulfilled client's need, and a fragmented need for care that leads to low completion (Papers II, III, and IV).

The quantitative study revealed that residence, educational status of partners, women's occupation, past history of PNC use, parity, time of ANC booking, knowledge about ANC and PNC, service given during ANC contact, and nature of care were the independent predictors for completion (Paper II). The qualitative study also demonstrated that hurdles to dropout from the continuum of care were: costs associated with the services; misinterpretation of concepts; sociocultural factors; shortfalls in supplies, infrastructure, human resources, linkage, and communication (Paper III).

In our study, being from a semi-urban area increased the likelihood of completing MHC. This finding is in line with the evidence from Uganda, where residence appears to be an independent predictor of MHC utilization (106). This could be explained by the fact that urbanization enables people to have more access to media, education, and health services within a shorter distance than those in rural areas, which has a significant effect on lowering the amount of cost to be utilized for MHC utilization.

Also, partners' education significantly predicts the completion of MHC. Women with college or higher education partners are nearly six times more likely to complete the continuum of care. This finding was in line with the evidence from Ethiopia, Ghana, and Zimbabwe, where educational status is a predictor of MHC utilization that determines completion (42, 106–109). This could be explained by the fact that educated partners have better opportunities to be informed about health benefits, can decide when and where their wives need care, can support their wives' lifestyle choices, have increased fiscal security through employment in the formal sector, have far-reaching social networks, and are more likely to be involved in community organizations that expand their personal networks; take note of cultural capital. However, partners with limited education often hinder discussions about reproductive health, do not know where to take her for healthcare, and are not able to recognize symptoms of ill health in a timely manner and seek medical help.

Women's occupation is a significant predictor of the completion of the MHC continuum. Government employees were almost three times more likely to complete CoC. This could

be because mothers with their own income are more likely to have the autonomy to decide; the governmental employees are indirectly educated women who have better information about the health benefits, know when and where to go for medical care, are in a better position to be supported by their spouse, have better access to health facilities, and have the capacity to pay the indirect or opportunity costs that are required for maternal healthcare completion.

Grand multiparous mothers were less likely to complete MHC in this study. This could be explained by the fact that women with higher parities are more likely to have previous experience of not using MHC but having a good birth outcome to use as a reference. Moreover, as the number of births increases, there is a high probability of having a large family, which may have an impact on the family's socioeconomic status and service utilization.

Service given during ANC contact is a significant predictor of the completion of the of MHC continuum. This finding is supported by the evidence generated through a systematic review and meta-analysis in Sub-Saharan African countries, where mothers who attended at least four ANC contacts were more likely to deliver in a health facility (5, 19), and the current movement toward viewing pregnancy as a window of opportunity to enhance women's overall health, as it serves as a gateway for them to access healthcare services. For instance, ANC increases the quality of information women will have about the importance of institutional delivery and postnatal care, increases women's familiarity with medical personnel and health facilities that are used in reducing the psychological costs related to seeking these services, and creates enabling or reinforcing habits to make use of these services (37, 110)

The nature of the care provided (supportive care) is a significant predictor of the completion of the maternal healthcare continuum. This is also consistent with the findings of an Egyptian study, which found that continuation of MHC is associated with partner education level, accessibility of services, and services provided during visits. For example, those who had urine and blood tests and blood pressure measured as part of the ANC were more likely to use SBA and PNC (43), antenatal complications, community health

worker counseling (13), interactions with health workers, quality of the ANC, place of residence, number of children, neonatal complication experiences, marital status, transportation, and beliefs about accessibility of services (66, 68, 77).

Sociocultural ("Michii" and "Gaaddidduu"), miss interpretation of concepts (COVID_19, "Rakkoon hin jiru"), knowledge gap, late booking for ANC, dishonest …kanaaf soba filanne, the 59 principles, high staff turnover, the lack of infrastructure, the time of onset of labor, the poor condition of the connecting roads, communication, and the indirect cost of maternal and child health services, which are often not covered in national-level intervention strategies and program actions, were among the factors indicated as barriers to dropout from the continuum of care (Paper III).

This finding was almost in line with the findings of a study in Assosa Zone, Benishangul Gumuz, and Northwest Ethiopia, where socioeconomic factors, knowledge of maternal health services, poor roads, health facility readiness, lack of ambulances, cultural and traditional beliefs, providers being male, women's education, urban residence, media exposure, perceived time to reach health facilities, and unprofessional behaviors were the major barriers to the uptake of maternal health services (98, 112)

The high staff turnover may be connected with the lack of infrastructure like electricity, water supply, and road access that affects recruitment and retention of qualified health personnel, which has an indirect impact on access to significant maternal health services, particularly in rural areas, as the health care system is being challenged by new graduates of care providers, which may lead to dropouts from care and women seeking care from unskilled providers (113).

In order to make MCH services more affordable and accessible, the Ethiopian government has subsidized them. Despite this initiative, this study found that the indirect cost of maternal healthcare is far greater than the direct cost, which limits women's access to and continuation of these services. Furthermore, by nature, most labors begin at night, and the poor state of maternal healthcare in rural areas [where the majority of the care providers were juniors] demands that women seek referral services to high level health facilities. The poor condition of the connecting roads, as well as the lack of suitable and reliable

transportation, contribute to delayed referral care. This condition is exacerbated during the summer season and at night as transportation providers' hike their tariffs beyond what most members of the community can afford, resulting in unexpected indirect costs that may contribute to dropouts from the continuum of care.

For instance, if an ambulance is not available, pregnant women are transported by inappropriate means such as commercial motorbikes and traditional ambulances, which may aggravate their already poor health. Delays in getting pregnant women to the referral facility sometimes resulted in fatalities and near-misses; this condition [fatalities and near-misses] may be used as a confirmatory factor for sociocultural views in the community, such as "Michii."

For low- and middle-income countries, including Ethiopia, birth outcomes remain the biggest challenge. In this study, the overall unfavorable birth outcome was 7.2% (CI, 5.7, 8.8) (Paper IV).

This finding was much lower than the findings reported in different parts of Ethiopia. For instance, a systematic review and meta-analysis reported that the pooled prevalence of unfavorable fetal outcomes was 26.88% (60); the study conducted in Gondar University Hospital reported 23% (62); Hawassa Town Governmental Health Institutions in South Ethiopia reported 18.3% (63); and the study in Bale Zone hospitals reported 21% (114).

Though the improvement is not satisfactory, this is expected and could be attributed to the increasing expansion of maternal health services over time, the current ministry of health, attention to maternal and child health services, and variations in the study settings. Also, most of the studies cited above were conducted at the level of health facilities, where mothers frequently go when they experience complications that may be the cause of the increase in the proportions of adverse birth outcomes, and Amhara region, the region that hosts the largest share of child brides that contribute to complications during childbirth and the birth outcomes (88, 89)

Additionally, the operational definitions used in some of the studies included stillbirth, preterm birth, low birth weight, small for gestational age, neonatal death, and congenital

anomalies, whereas only preterm birth, stillbirth, low birth weight, and neonatal death within the first 42 days were used in this study.

Utilizing MHC offers opportunities for monitoring feto-maternal health and enabling prompt intervention for feto-maternal protection (115). The time of booking and the times of contacts are among the fundamental elements of the services; this enables mothers to receive full packages of maternal health services (23).

Also, WHO recognized the synergy and complemetarity of antenatal, facility delivery, and postnatal care to prevent and or reduce adverse outcomes (33, 34) over fragmented care as it ensures the mothers receive the full packages of maternal services and early detection, management, and prevention of complications throughout the continuum of care (16, 80).

The study conducted in Egypt reported that women who attended an inadequate number of visits had a 53-fold risk of a poor fetal outcome and a significantly higher risk of neonatal mortality compared with women who had an adequate number of antenatal visits (116).

This implies that what matters is not only the times of contacts but also the quality of the service that enables early identification and management of obstetric complications that could contribute to birth outcomes and the continuation of MHC (90, 92). Also, a systematic review about interventions to reduce preterm birth, stillbirth, and LBW in MLICs reported that there was no significant difference in birth outcomes among ANC users and non-users (117), and the evidence from 18 LMICs DHS reported that what matters is the quality of ANC services given during ANC contact rather than the frequency of ANC for preventing LBW (55).

Even though each element of the MHC continuum provides essential and potentially lifesaving services and is used to avert birth related complications. But ,the skill, motivation, supportive interactions, and readiness of healthcare providers to provide the WHO recommended standards of care that can help to avert the complications and facilitate positive health seeking behavioral changes are critical (118).

Also, we cannot draw the conclusion that the completion visits would be sufficient to prevent adverse birth outcomes because adverse birth outcomes are linked to collective interventions and complex, multifactorial etiologies such as service quality, societal factors, environmental exposures, and the promotion of nutritional taboos in some cultures, which may deprive people of essential nutrients and exacerbate nutritional deficiencies, resulting in less maternal weight gain during pregnancy, which is reflective of poor fetal growth, parity, maternal age, gestational ages, and culturally unacknowledged rest for pregnant women (119–121).

This finding is partly congruent with the reported findings of other studies: residency, antenatal care follow-up, history of adverse pregnancy outcomes, advanced maternal age, having complications of pregnancy, presence of a cat in the house, having chronic disease(s), and knowledge of preconception care were significant predictors of adverse birth outcomes (53, 81, 82, 96).

Educated partners have a better opportunity to access medical facilities and a better income. These may help them to learn about pregnancy and related complications that lead them to access health facilities and have regular visits that help with early detection, management, and prevention of pregnancy-associated complications that contribute to birth outcomes.

Women's family size is among the predictors of birth outcomes. Women with fewer children are more likely to take care of themselves, be knowledgeable about pregnancy-related issues, have access to medical facilities, and make regular visits that aid in the early detection, management, and prevention of difficulties connected to pregnancy.

Grand multiparous mothers were more likely to have unfavorable birth outcomes in this study. This could be explained by the fact that women with higher parities are more likely to have medical and obstetric complications like anemia and other obstetric complications, and as the number of births increases, there is also a high probability of having a large family, which may have an impact on the family's socioeconomic status and service utilization, which in turn contribute to birth outcomes.

In general, pregnancy is viewed as a window of opportunity to improve the overall health of women (28), and making the ANC increases the quality of information about the importance of institutional delivery and postnatal care, familiarity with medical personnel and health facilities, and creates reinforcing habits that increase the likelihood of health facility delivery and PNC use (1, 4, 21, 76).

Despite the proven interventions, the findings of this study appears to be paradoxical and do not support our hypothesis, as less than one in every five pregnant women who began ANC would be able to complete the recommended continuum of care, the time and frequency of ANC contacts and completion of the continuum of care were statistically not significantly associated with birth outcomes (Paper II and IV).

This might be explained by the fact that in this study, 73.4% of women had their first ANC contact in a health center, and those facilities do not have the facilities necessary to provide comprehensive and quality care, which affects the outcomes of births. Also, 76.4% of them had late booking, 76.6% said their service package was incomplete, and only 21.6% of the women thought they had received PCMC, which may have also had an impact on the way birth outcomes are affected by completion, and completion alone is unlikely to affect outcomes.

8.2.Methodological considerations

This dissertation provides vital information about maternal healthcare utilization in the context of the study area. However, there are methodological issues to be considered in interpreting the findings of this study.

8.2.1. Study design

This study could have benefits from employing a multimethod research design and data from different sources. This approach would enable us to contextualize our findings, enhance the validity of our conclusions (122), and produce comprehensive findings with implications for programs and policy.

Also, the design of this study allowed us to evaluate the actual situation of maternal healthcare practices and birth outcomes. It attempted to collect all birth outcomes that occurred both at health facilities and at home, and it reached out to mothers who had completed the care and dropout. This approach helped us to manage mothers' current recall of service usage and reduce recall bias. Additionally, we used a large sample size, which resulted in great analytical power and precision.

However, the findings of this study should be interpreted with the following constraints: Despite the high sample size, this study was based on two districts selected at random due to the logistical complexities of the follow-up study. Owing to the insufficient count of cases, it was not possible to examine specific adverse birth outcomes separately with respect to completion of MHC continuum. In addition, this study does not include other birth outcomes such as maternal outcomes, small for gestational age, and congenital anomalies. The cut-off point for the follow-up was a gestational age of less than or equal to 26 weeks. The dichotomization or classification of the composite variables at various cut-off points may have its own limits when referring to proportion. Numerous variables, such as wealth quintiles, PCMC, knowledge of MHC, social support, and maternal healthcare utilization, were subjective. All possible efforts were made to use standards and as many variables as possible to make them more objective. Also, this study examined access to health facilities but did not address the quality of the service, which could have been among the determinants and may be an area for further research.

8.2.2. Validity

Every study strives to maximize the validity of its findings. This thesis employed all available measures to ensure both internal and external validity at all phases, including the definition of the research question and hypothesis, the design, the data collection procedures, and the data analysis and interpretation. As an observational study, this dissertation used rigorous methods and control measures to enhance its quality and reduce threats such as selection bias, confounding, and measurement errors at all stages. However, it might have threats that could emerge from history, maturation, social interaction, and attrition bias.

8.2.3. Generalizability

Generalization of findings is an important aspect of research and essential for evidence-based practice. To be useful, research findings must be applicable and relevant for other settings and people outside of the context studied. Generalizable results are used to inform and guide policy making, and to design and develop interventions with a wider range of applications. The ability to generalize is a key criterion for quantitative and transferability is essential in qualitative research (123, 124).

This dissertation used a multimethod research design, data from various sources, a representative sample size selected by probability sampling that produced statistically sound results, and pretested instruments that allowed us to provide accurate and comprehensive results. Hence, it is possible to generalize the findings of this study to some parts of Oromia that share similar population characteristics, socio cultural, access to healthcare, healthcare seeking behaviors, and heterogeneity arising from differences in participant characteristics like age, parity, and previous birth complications.

Still, the capacity to generalize findings to other regions may depend on the similarities of the existing socio-cultural, socio-economic, and maternal healthcare-related factors. Transferability is also used depending on the similarities of the cultural contexts of the study area and population.

8.2.4. Ethical considerations

To comply with the existing research guidelines, the National Research Ethics Review Guideline was consulted (125).

The protocol was presented to the department and submitted to the Institutional Review Board (IRB). Ethical approval was granted from Jimma University, Health Institute, IRB with Ref.No IHRPGD/433/2019.

Similarly, administrative clearance was obtained from the zone and selected district health offices. Informed consent was obtained prior to data collection, and participation in the study was entirely voluntary. The participant had the right to leave the interview at any

time. Data collectors were trained to preserve the anonymity, confidentiality, and privacy of the participants, deliver appropriate health information based on participant needs, and arrange referrals to medical facilities for mothers who had issues in order to avert any complications.

Chapter Nine: Conclusions and implications of the study

9.1. Conclusions

The completion of the maternal healthcare continuum is underdeveloped. Less than one out of five pregnant women who began ANC would be able to complete the recommended continuum of care. The most significant gaps observed in institutional delivery and postnatal care.The adverse birth outcome was indeed remarkable. A paradox

was observed between reality and expectations derived from theoretical models. And despite the benefits of completing MHC, women are distancing themselves from it, and the completion rate is low. Statistical analysis revealed no significant association between the completion of the continuum of care and the birth outcome (discussed in Paper II and IV). Also, each element of the continuum of MHC completion was lower than the national proportion, except for facility delivery(51).

The completion of MHC and birth outcomes have been affected by various parameters. This encompasses trichotomic (individual, community, and health system) level factors, which demand the readiness of care providers, community level interventions and robust health system strengthening.

Predictors for the completion of the continuum of care and birth outcomes include women's residence and occupation, their partners' educational status, complications during delivery, time of booking for ANC and times of ANC contacts, service given during the ANC contacts, knowledge about ANC and PNC, nature of care, and social support. Ingeneral, this study found that the completion of the continuum of care was paradoxical. Also, it needs strong collaboration with non-health sectors as much of the barriers will be averted by other sectors.

9.2. Implications of the study

In spite of the fact that continuity of MHC is a key strategy for reaching mothers and newborns at a crucial time (1,3,4). Our study came to the conclusions that the completion status of MHC was low, thousands of women still walk away from MHC, and the benefits gained by the completion of the continuum of MHC in improving birth outcomes are not statistically significant. This suggests that what matters is not only the completion of contacts but multiple factors like the quality of the service and the expertise of the care providers used for early detection and management of obstetric complications that could contribute to birth outcomes.

In general, this evidence has implications for those who decide on maternal health policy and design strategies, healthcare providers, mothers, the community, and researchers in this area. Therefore, interventions have to targeting the trichotomic attributes that influence maternal healthcare use, completion, and birth outcomes.

9.2.1. Implications for health managers and program implementers

Efforts to way outing and implement interventions that address the shortfalls in supply, logistics, and infrastructure, including electricity and water supply. This is being done in conjunction with strengthening the capacity of health facilities to provide comprehensive and complete packages of maternal healthcare during each service contact. Strategies for integration and collaboration are being revisited with sectors such as women and child affairs, skill and labor affairs, the water and mineral bureau, the road and transportation authority, and the education bureau are being revisited for sustainable changes. Improvements are also being made to address barriers on the care providers' side, such as high staff turnover and human resource shortages. Measures are being taken to avert the hidden or indirect costs associated with healthcare provision.

Finally, efforts are being made to create a habitable and enabling environment, as well as to implement context-sensitive healthcare, which is critical to lowering dropout rates. These collective efforts aim to enhance the overall quality of healthcare, increase the completion rate, and positively impact birth outcomes

9.2.2. Implications for health providers

It is imperative to place significant emphasis on all stages of the Maternal Healthcare Continuum (MHC) and to provide equal attention to Antenatal Care (ANC), Intrapartum Care (ID), and Postnatal Care (PNC). This approach is essential for ensuring that women receive continuous and comprehensive maternal healthcare throughout their pregnancy, delivery, and postpartum period, ultimately leading to better health outcomes.

9.2.3. Implications for community, family, and individual woman

It is imperative to place significant emphasis on all stages of the Maternal Healthcare Continuum (MHC) and to provide equal attention to Antenatal Care (ANC), Intrapartum Care (ID), and Postnatal Care (PNC). This approach is essential for ensuring that women receive continuous and comprehensive maternal healthcare throughout their pregnancy, delivery, and postpartum period, ultimately leading to better health outcomes. Additionally, having comprehensive knowledge of socio-cultural norms that can affect the communities' attitude toward maternal healthcare is equally important.

9.2.4. Future researchers

Despite the high sample size, due to logistical issues, this study was based on limited districts. Maternal and neonatal outcomes, such as small for gestational age, congenital anomalies and abnormalities, and quality of care, are not included in this study. Hence, further research is recommended to fully understand these paradoxes, context-specific barriers, and their implications on a larger scale.

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Annexes

Health Institute

Faculty of Public Health

Population and Family Health Department

Annex I: Subject information sheet

Title of the study: Maternal healthcare in the context primary health care facilities in Jimma zone: Paradox in the continuum of care completion and birth outcomes.

Background and purpose of this study

Hello! Good morning/Afternoon/Evening!

My name is: _____, I am requesting you to participate in a PhD research project on continuum of care for maternal health care. You are selected as a subject to give information on your demographic data and knowledge/experiences of continuum of care for maternal health care in the past and current.

Purpose of the study

In this study we aim to generate evidence about continuum of care for maternal health care. You are asked to participate because you are selected randomly. The project will be carried out at Dedo and Nada district. Data will be collected through face-to-face interview.

Potential advantages and disadvantages

As participant in this study you will have an opportunity to communicate with research team regarding continuum of care. Except the time you spent during the interview with the interviewer, there are no anticipated risks or discomforts related to the study. In case there is any discomfort or inconveniences please let us know.

What will happen to the information about you?

The data that you will give us only used in accordance with the purpose of the study as described above. All data will be processed without any directly recognisable type of information. It will not be possible to identify you in published or presented results from the study. All data will be kept anonymised.

Voluntary participation

Participation in the study is voluntary. You can withdraw your consent to participate in the study at any time and without stating any particular reason. This will not have any penalty for your not participating in the study. If you wish to participate, we ask you to consent on the final page. If you agree to participate at this time, you may later withdraw your consent without any prerequisites.

If you have questions concerning the study, you may contact **Sena Balina Kitila**

Phone number +2519-1211-2666 email: senabalina26@gmail.com

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Annex II: Consent for Participation in the Study

I have been asked to participate in the study "Maternal healthcare in the context primary health care facilities in Jimma zone: Paradox in the continuum of care completion and birth outcomes". I have received information about the study, benefits and possible risks. I have also been given the name and address of a researcher who can be easily communicated in case of any discomfort or inconveniences. I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it. Any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this research. I understand that I have the right to withdraw from the research at any time without prerequisite.

- ID of Participant: _____
- Signature of Participant: _____
- Date (day/month/year): _____/_____/_____

If the participant cannot read and write

A literate witness; a person who will have no connection with the research team will be selected by the participant, to sign the consent on behave of the participant

I have witnessed that the accurate reading of the consent form to the participant, and the participant had the opportunity to ask questions. I confirm that the individual has given consent freely.

- ID of witness: _____
- Signature of witness: _____
- Date (day/month/year): _____/_____/_____
- Relationship with the participant: _____ [1]

[1] *A copy of the informed consent form has been provided to participant _ (initialed by the researcher/assistant)*

Annex III: Questionnaire English version

Jimma University

Health Institute

Faculty of Public Health

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Basic, past experience and general information during recruitment

Section 1. Identification			
Supervisor Name		Interviewer Name	
① District: o Dedo o Omo Nada			
Name of : ① Kebele _____ ① Zone /Gare_____HH code_____			
Date of interview (dd/mm/yyyy): ___ / ___ / ____			
Section 2. Socio demographics			
Interview Say: "I am going to start by asking you some questions about you and your household."			
S.#	Questions	Responses	Skip
201	Client /house hold code	[_____] in number	
202	Role in the household	1. Spouse 2. Head of household 3. Other (Specify)_____	
203	What is your age?	[_____] in completed years	
204	What is your religion? (Do not read list)	1. Muslim 2. Orthodox 3. Protestant 4. Wakeffeta 5. Other (Specify)_____	
205	What is your Ethnicity?	1. Oromo 2. Amhara 3. Kefa 4. Dewaro 5. Other (Specify)_____	
206	Where do you live?	1. Urban 2. Rural	
207	Educational status -[Pregnant women]	[_____] in number /Text	
208	What is your [Pregnant women] Occupation?	2. Farmer 3. Merchant 4. Government employee 5. Daily laborer 6. Others (specify) _____	

209	What is your current marital status? (Do not read list)	1. Married 2. Divorced 3. Widowed 4. Single 5. Other specify _____			If Single skip to Q # 214
210	What is type of your marriage	1. Monogamy 2. Polygyny			
211	What is your partner's age? [Current]	[_____] in completed years 99. Don't Know			
212	Educational status – [Partner]	[_____] in number/Text 99. Don't Know/remember			
213	What is your [partner's] occupation?	1. Farmer 2. Merchant 3. Government employee 4. Daily laborer 5. Others (specify) _____			
214	Total family size	Total	Male	Female	
Section 3: Socio economic background					
301	Do you own any of the following animals? 1. Cows/Oxen /bulls 2. Horses/donkey/mules 3. Goats/ Sheep 4. Others (Specify) _	1. Yes 0. No if Yes how many [_____] 1. Yes 0. No if Yes how many [_____] 1. Yes 0. No if Yes how many [_____]			
302	Does any member of this household own any agricultural land?	1. Yes if Yes, in [ ] hectares 0. No			
303	Does any member of this household own any coffee plant?	1. Yes if Yes, in [ ] hectares 0. No			
304	Main material of the floor? For data collector: Observe!	1. Earthen material 2. Concrete 3. Other (specify)_____			
305	Main material of the roof	1. Thatched/ grass roof 2. Corrugated iron sheet 3. Other (specify)_____			

306	Does your household have: 1. Electricity? 2. Solar 3. Radio? 4. A television? 5. Mobile telephone? 6. Bed with cotton/sponge/ mattress? 7. An electric mitad? 8. Kerosene lamp/pressure lamp/ solar? 9. Motorbike 10. Car 11. Bajaj 12. An animal-drawn cart?	 1. Yes 0. No 1. Yes 0. No 1. Yes 0. No 1. Yes 0. No 1. Yes 0. No 1. Yes 0. No 1. Yes 0. No 1. Yes 0. No 1. Yes 0. No 1. Yes 0. No 1. Yes 0. No 1. Yes 0. No	
307	What is the source of fuel for cooking for this household? (multiple response possible)	1. Electricity 2. Bio gas 3. Kerosene/nafta 4. Firewood 5. Charcoal 6. Others	

Section 4:Birth History and Maternal health care utilization (Previous Experience on current)

4.1 Birth History: I am going to ask you about your birth history and MHCU. Please respond to the following questions

411	How many times have you been pregnant? [In general]	[_____] times	
412	How many a live born children have you ever had?	[_____] times	
413	Have you had history of Abortion?	No 1. Yes	
414	Have you had history of still birth or child death?	No 1. Yes	
415	How long ago was your last [child's name] birth?	[_____] years	
416	During your index birth [child's name] did you used ANC checkups?	0. No 1. Yes	If No >422
417	Where did you gone for the ANC check-up visit(s)? NB :multiple answer is possible	1. Health Post 2. Health Center 3. Hospital 4. At home by TBA 5. Other (specify)_____	
418	How many times did you visited health facility for ANC	[_____] In number Don't remember	
419	During your index pregnancy, who did see you or who provided pregnancy checkup at first? (Do not read list, multiple answer is possible)	1. Health care provider (Doctor, HO, Nurse) 2. Traditional Birth Attendant 3. Health Extension Worker 4. Other (specify)_____	

420	At ANC, which services did	Questions	Responses			
			1. No	2. Don't know	3. Yes	
		1. Gestation age calculated (LMP)				

	you receive? (Do not read the responses below. Allow respondent to answer, and then fill each item below.)	2. Blood pressure checked				
		3. Weight checked				
		4. Pallor checked				
		5. Uterine height (Wks)				
		6. Fetal heart beat				
		7. Blood group and Rh factor				
		8. Hemoglobin test				
		9. Urine test for infection & protein				
		10. TT (dose)				
		11. Rapid syphilis test				
		12. Iron/Folic Acid				
		13. Any drug for intestinal worms				
		14. Offered HIV testing				
		15. Malaria (ITN use)				
		16. Other (specify)_____				

421	At ANC, did you advised about	1. When and how many times I need to receive ANC	Yes (1)	No (0)	
		2. BPCR plan			
		3. Advised on danger signs			
		4. Nutrition and exercises during pregnancy			
		5. How to prevent malaria (ITN use)			
		6. Exclusive breastfeeding			
		7. Other (specify)_____			

422	Did you have any complications during your last pregnancy?	0. No 1. Yes			If No → K421
423	If yes, for Q 422 what were the complications you had during your last pregnancy?	1. Vaginal bleeding	Yes	No	
		2. Severe abdominal pain			
		3. Fits			
		4. Severe headache			
		5. Fever			
		6. Fast/difficult breathing			
		7. Other (specify)_____			
424	Did you receive care for the complications?	0. No 1. Yes			
425	If Yes, for Q 424 where did you receive the care?	1. Health Post 2. Health Center 3. Hospital 4. At home traditional 5. Other (specify) _____			
426	Were you Referred for that?	1. No 1. Yes			

4.2 Knowledge on ANC

K421	ANC is essential for promoting health and well-being as well as healthy pregnancy outcomes.	Agree	Don't know	Disagree
K422	Regular ANC contacts enable healthcare providers to monitor the health of both the mother and the foetus and enable early detection and management of complications.			

K423	The first ANC contact should be made in the first trimester.			
K424	Early booking for ANC is good for both the mother and foetus.			
K425	ANC allows pregnant women to take TT injections during pregnancy.			
K426	ANC allows pregnant women to take iron and folic acid supplements.			
K427	Making four or more ANC visits is recommended during pregnancy.			
K428	Even if there are no complications, pregnant women are recommended to go to a health facility for ANC.			
4.3 Maternal health care utilization [Delivery care for your last pregnancy]				
D431	Where did you [child's name] give birth?	1. At Home 2. Hospital 3. Health center 4. Health post 5. Others (specify _____)		If at home → D434
D432	How did you go to the place, where you delivered?	1. On foot 2. Motorbike 3. Taxi 4. Other (specify)_____		
D433	How long did it take you to get there?	[_____]minutes		
D434	Why did you choose the place you delivered?	1. Wanted to deliver safely 2. Because I had problem during pregnancy 3. Because I had health problem 4. Family's/relative's/friend's suggestion 5. Because it was close from home 6. Other (specify		
D435	Who assisted you during the [name of the child] most recent birth? (Do Not Read List) (Multiple Answers Possible)	1. Health care provider 2. Traditional Birth Attendant 3. Health Extension Worker 4. Family/Friend/relatives 5. Other (Specify: (_____)		
D436	Your mode of delivery	1. SVD 2. Caesarean section		
D437	Did you have complications during delivery?	1. No 1. Yes 99 = don't know		If No > D4312
D438	What kinds of complications did you have? (select all that apply)	1. Prolonged labor (>12 hrs) 2. Heavy bleeding 3. Premature rupture of the membrane 4. Infection/Fever 5. Other specify 99 = don't know		
D439	Did you receive care?	1. No 1. Yes		
D4310	If Yes, for D439 where did you receive care?	1. Health Post 2. Health Center 3. Hospital 4. At home traditional 5. Other (specify) _____		
D4311	Were you referred?	1. No 1. Yes		

D4312	Did your [child Name] have any complications during delivery?	1. No 1. Yes	
D4313	What was the complications of your birth	1. Preterm birth 2. Still birth 3. LBW 4. Neonatal death 5. Other (Specify: (_____))	

4.4 Knowledge of delivery care

		Agree	Disagree	Don't know
K441	It provides access to SBA, early detection and management of complications that improve maternal and newborn health outcomes.			
K442	Maintain a safe and clean environment for childbirth which can prevent health problems for mothers and newborns.			
K443	Maintain early initiation and exclusive breastfeeding			
K444	Institutional delivery allows for better postpartum care for mothers and newborns.			
K445	Even if there are no complications, pregnant women are recommended to go to a health facility for birth.			

4.5 Maternal health care utilization [Postnatal care for mother and infant]

P450	If not home delivery, for how long did you stay at the place after you (name) delivered?	1. Less than 24 hours after delivery 2. 24 hours or longer after delivery 99= don't remember	
P451	After (name) was born, did anyone check your health after birth?	1. No 2. Yes 99 = don't know	
P452	After being discharged from the place you delivered or after you delivered at home, do had PNC?	1. No 2. Yes 99= don't remember	If No > P457
P453	If Yes, for Q P452 how many times did you receive PNC?	[_____] times in number 99= don't remember	
P454	If Yes, for Q P452 where did you receive the 1st PNC (after discharge)?	1. Hospital / Health center 2. HP 3. Home by HEWs 4. Other (specify_____	
P455	If Yes, for Q P452 how did you get to the place, where you received the 1st PNC?	1. On foot 2. Bicycle /Motorcycle 3. Taxi 4. Other (specify)_____	
P456	How long did it take you to get there?	[_____]minutes	
P457	Did you have complications within 6 weeks after delivery?	0.No 1. Yes 99=don't know	If No > P4511
P458	Did you receive care?	1. No 1.Yes	
P459	Where did you go to seek for treatment?	1. Hospital /Health center 2. HP 3. Private clinic 4. TBA's home 5. Home by HEWs	

		6. Other (specify_____	
P4510	Were you hospitalized?	0. No 1. Yes	
P5511	After birth, did [child's name] have any danger sign(s)?	1. No 2. Yes 99=don't know	If No > K461
P5512	What kinds of danger sign(s) did [child's name] have? Please don't read the following items. Circle all items that the mother answers.	1. Very small 2. Had difficulty breathing 3. Had fever 4. Bleeding spots/patches in skin 5. Too weak to suck/feed 6. Yellowish 7. Did not cry 8. Other (specify)	
P5513	Did he/she receive care?	1. No 1. Yes	
P5514	Where did he/she receive care?	1. Hospital / Health center 2. HP 3. Home by HEWs 4. Other (specify_____	

4.6 Knowledge on PNC

K461	PNC is important for promoting the health and well-being of both mothers and newborns after childbirth	Agree	Don't know	Disagree
K462	PNC is important for early detection and management of PNC dinger signs and prevention of complications.			
K463	PNC is important for early initiation of breastfeeding and newborn vaccinations			
K464	PNC provide opportunity to provide education and support to parents on topics like newborn care, postpartum recovery, and family planning.			
K465	Mothers are advised to make routine PNC visits after being discharged from the place of delivery			
K466	Mothers who have given birth are advised to obtain a PNC even if they have no complications or risk indicators.			

Thank you for your time!!!!!

Phase Specific and about current experience

Phase I: ANC

Section 1. Identification		
Supervisor Name		Interviewer Name
① District: o Dedo Omo Nada		
Name of: ① Kebele _____ Zone /Gare_____HH code_____		
Date of interview (dd/mm/yyyy): ___ / ___ / ____		

Section 2: Maternal health care utilization (current) [ANC]

I am going to ask you about your ANC. Please respond to the ff questions

021	Are you using your ANC (pregnancy checkups as per the recommendation)?		1. No 1. Yes	If No →029
022	How many weeks pregnant were you when you had your ANC checkups?		___In weeks	
023	Where did you gone for ANC check-up? NB :multiple answer is possible	Health Post	ANC 1st	2nd / 3rd / 4th
		Health Center		
		Government Hospital		
		Private Hospital/clinic		
		Other (specify) _____		
024	How did you get to the facility, where you received the ANC [1st/2nd/ 3rd /4th]?	1. On foot		
		2. Motorcycle		
		3. Taxi		
		4. Other specify		
025	Approximately how long did it take you to get to the facility, where you received the [1st/2nd/ 3rd /4th] ANC? In minutes			
026	At your ANC, what services did you receive? (Do not read the responses below. Allow respondent to answer, and then fill each item below.) 1 = No 2 = Don't know 3= Yes	1. Gestation age calculated (LMP)		
		2. Blood pressure checked		
		3. Weight checked		
		4. Pallor checked		
		5. Uterine height (Wks)		
		6. Fetal heart beat		
		7. Urine test for infection & protein		
		8. Rapid syphilis test		
		9. Hemoglobin		
		10. Blood group and Rh factor		
		11. TT (dose) / checked		
		12. Iron/Folic Acid/checked		
		13. Any drug for intestinal worms		
		14. Offered HIV testing		
		15. Other (specify)_____		
027		1. When and how many times I need to receive ANC		
		2. Nutrition of the mother		

	At ANC, what did you advised? Yes….1 No…..0	3. Advised danger signs				
		4. Recommended place for delivery				
		5. Items to be prepared for delivery and baby				
		6. Means of transportation for emergency				
		7. Counseled on Infant feeding				
		8. Early initiating and exclusive breastfeeding				
		9. Family planning				
		10. How to prevent malaria (ITN use)				
		11. Counseled on when to return for next				
028	Did you had all ANCvisists (at least four) checkups?		0. No 1. Yes		If No > 029	

Difficulties in receiving ANC [For those missed their checkup]

029	Why did you miss your ANC follow up? [environmental/climate/geographical/cultural]	1. Not necessary to go health facility	Agree	Disagree	Don't know
		2. The services mode are not according to our customary			
		3. Partner/family did not allow			
		4. No one could accompany me to go to ANC			
		5. Partner wasn't supportive about going to ANC			
		6. No female care providers			
		7. Don't trust health providers			
		8. Facility was closed			
		9. Too far and transportation			
		10. Topography of the area			
		11. Costs too much			
		12. Poor quality of service			
		13. Unless there is a problem, it is not cultural to go			
		14. Inconvenient service hour			
		15. Other (specify) _____			

030	Did you have any complications during this pregnancy?		0.No	1. Yes	If No :End
031	What were the complications you had during this pregnancy?	1. Vaginal bleeding	0.No	1. Yes	
		2. Severe abdominal pain	0.No	1. Yes	
		3. Fits	0.No	1. Yes	
		4. Severe headache	0.No	1. Yes	
		5. Fever	0.No	1. Yes	
		6. Fast/difficult breathing	0.No	1. Yes	
		7. Other (specify)_____	0.No	1. Yes	
032	Did you receive care?		0.No	1. Yes	
033	If Yes, where did you receive care?	1. Health Post	0.No	1. Yes	
		2. Health Center	0.No	1. Yes	
		3. Hospital	0.No	1. Yes	
		4. At home traditional	0.No	1. Yes	
034	Were you hospitalized?		0.No	1. Yes	

Key: Write: Yes =when the activity is done; No= when the activity is not done. DK= when they don't know/remember

Thank you for your time!!!!!

Phase II: ID (Institutional delivery)

Section 1. Identification			
Supervisor Name		Interviewer Name	
① District: o Dedo o Omo Nada			
Name of: ① Kebele _____ ① Zone /Gare_____HH code_____			
Date of interview (dd/mm/yyyy): ___ / ___ / ____			
S.#	Questions	Responses	Skip
Section 2. Maternal health care utilization [Delivery care]			
201	Where did you [child's name] give birth?	1. At Home 2. Hospital 3. Health centers 4. Health post 5. Others (specify _____)	If at home > 204
202	How did you go to the place, where you delivered?	1. On foot 2. Bicycle /Motorcycle 3. Taxi 4. Other (specify)_____	
203	How long did it take you to get there?	[_____]minutes	
204	Your mode of delivery	2. SVD 2. Caesarean section	
205	Who assisted you during the [name of the child] most recent birth? (Do Not Read List) (Multiple Answers Possible)	1. Health care provider 2. Traditional Birth Attendant 3. Health Extension Worker 4. Family/Friend/relatives 5. Other (Specify: (_____)	
206	Why did you choose the place you delivered? (If facility delivery)	1. Wanted to deliver safely 2. Because I had problem during pregnancy 3. Because I had health problem 4. Family's/relative's/friend's suggestion 5. Because it was close from home 6. Other (specify	
207	Did you have complications during delivery?	1. No 1. Yes 99 = don't know	If No> 213
208	What kinds of complications did you have? (select all that apply)	1. Prolonged labor (>12 hrs) 2. Heavy bleeding 3. Premature rupture of the membrane 4. Infection/Fever 5. Other specify 6. 99 = don't know	
209	Did you receive care?	1. No 1. Yes	

210	If Yes, for 209 where did you receive care?	1. Health Post 2. Health Center 3. Government Hospital 4. Private Hospital/clinic 5. At home traditional 6. Other (specify) _____	
211	Were you hospitalized?	1. No 1. Yes 99 = don't know	
212	Did your Newborn had complications during delivery?	1. No 1. Yes	
213	What was the outcome of your birth	1. Preterm birth 2. Still birth 3. LBW 4. Neonatal death 5. Other (Specify: (_____)	

Difficulties in receiving delivery care (If home delivery)

214	Difficulties in receiving delivery care [environmental/climate/geographical /cultural]			
	1. Not necessary to go health facility	Agree	Disagree	Don't know
	2. The services mode are not according to our customary			
	3. Partner/family did not allow			
	4. No one could accompany me to go to DC			
	5. Partner wasn't supportive about going to DC			
	6. No female care providers			
	7. Don't trust health providers			
	8. Facility was closed			
	9. Too far and transportation			
	10. Topography of the area			
	11. Costs too much			
	12. Poor quality of service			
	13. Unless there is a problem, it is not cultural to go			
	14. Service delivery is not sex preference based			
	15. Time of onset of labour			
	16. Other (specify) _____			

Thank you for your time!!!!!

Phase III: PNC and General perception about the service

Section 1. Identification			
Supervisor Name		Interviewer Name	
District:	Dedo Omo Nada		
Name of:	① Kebele _____ Zone /Gare_____HH code_____		
Date of interview (dd/mm/yyyy): ___ / ___ / ____			
Section 2. Maternal health care utilization [Postnatal care for mother and infant]			
Mother's PNC			
I am going to ask you about your PNC. Please respond to the ff questions			
201	After (name) was born, did anyone check your health after birth?	0. No 1. Yes	
202	After being discharged from the place you delivered or after you delivered at home, did [child's name] you received PNC?	1. No 2. Yes	If No> 208
203	If Yes, for Q 202 where did receive the PNC (after discharge)?	1. Hospital/Health center 2. HP 3. Home by HEWs 4. Other	
204	Why did you want [child's name] to receive PNC?	1. Wanted to get a checkup 2. Worried about health problem 3. Health worker's instruction to receive PNC 4. Family's/friend's suggestion to receive PNC 5. Other (specify	
205	How did you get to the place, where you took [child's name] to receive PNC?	1. On foot 2. Motorbike 3. Taxi 4. Other (specify)	
206	How long did it take to get to the place, where [child's name] received the PNC?	[_____] minutes 99=don't know	
207	Did you had all PNC visists (four) checkups?	0. No 1. Yes	If No > 208

Difficulties in receiving PNC

208	Difficulties in receiving PNC [environmental/climate/geographical /cultural]			
	1. Not necessary to go health facility	0. No	1. Yes	99.don't know
	2. The services mode are not according to our customary			
	3. Partner/family did not allow			
	4. No one could accompany me to go to PNC			
	5. Partner wasn't supportive about going to PNC			
	6. Difficult to go with the child			
	7. Don't trust health providers			
	8. Facility was closed			
	9. Too far, transportation, and topography of the area			
	10. Costs too much			
	11. Poor quality of service			
	12. Unless there is a problem, it is not cultural to go			

	13. The societal norm and culture does not allow us				
	14. Other (specify) _____				
209	Did you have complications after delivery?	0. No 1. Yes 99=don't remember			If No>208
210	What were the complications you had?	1. Fever 2. Easily felt tired 3. Bleeding 4. Problem in urination 5. Breast problem 6. Other (specify			
211	Did you receive care?	0. No 1. Yes			
212	Where did you go to seek for treatment?	1. Hospital /Health center 2. HP 3. TBA's home 4. Home by HEWs 5. Other (specify			
Infant's PNC		**Response**			**Skip**
213	Immediately after birth, did [child's name] have any danger sign(s)?	1. No 2. Yes 99=Don't know			If No > 215
214	What kinds of danger sign(s) did [child's name] have? Please don't read the following items. Circle all items that the mother answers.	1. Very small 2. Had difficulty breathing 3. Had fever 4. Bleeding spots/patches in skin 5. Too weak to suck/feed 6. Yellowished 7. Did not cry 8. Other (specify)			
215	Did [child's name] have any health problems within 6 weeks of age?	1. No 2. Yes			If No > G101
216	What were the health problems of [child's name]?	1. Fever 2. Diarrhoea 3. Vomiting every feed 4. Kin pustules or boils 5. Excess crying 6. Cough 7. Yellowished 8. Not gaining weight 9. Other (specify			
217	Did he/she receive care?	0. No 1. Yes			
218	Where did [child's name] received care?	1. Hospital /Health center 2. HP 3. Home by HEWs 4. Other (specify_____			
219	What was the outcome	2. Improved 2. Dead			

Thank you for your time!!!!

General Questions

Section 1. Decision making Autonomy[In general/current]			
101	Who decided for you to get health care use for your health concerns (ANC, DC, or PNC)?	1. Alone 2. Joint [Both of them] 3. Respondent and someone else 4. Partner/partner alone	
102	Who decided for you to get Health care use for your child health concerns (immunization, illness)	1. Alone 2. Joint [Both] 3. Respondent and someone else 4. Partner/partner alone	
103	How do you decided on large household purchases	1. Alone 2. Joint [Both] 3. Respondent and someone else 4. Partner/partner alone	

Section 2. Women -Centered maternity care (PCMC)					
201	How did you feel about the amount of time you waited?	Service	Very short	Somewhat long	Very long
		ANC			
		ID			
		PNC			

	Dignity/Respect	Yes	No	Don't know
201	Did the HCPs or other staff at the facility treat you with respect?			
202	Did the HCPs and other staff at the facility treat you in a friendly manner?			
203	Did you feel the HCPs shouted at you, insulted, or talked to you rudely?			
204	Did you feel like you were treated roughly like pushed, beaten, slapped, pinched, physically restrained, or gagged?			
205	During examinations, were you covered up with a cloth or blanket or screened with a curtain so that you did not feel exposed?			
206	Do you feel like your health information was or will be kept confidential at this facility?			
	Communication and Autonomy			
207	During your time in the health facility did the HCPs introduce themselves to you when they first came to see you?			
208	Did the HCPs call you by your name?			
209	Did you feel like the HCPs or other staff at the facility involved you in decisions about your care?			
210	Did the HCPs or other staff at the facility ask your permission/consent before doing examinations on you?			
211	During the delivery, do you feel like you were able to be in the position of your choice?			
212	Did the HCPs or other staff at the facility speak to you in a language you could understand?			
213	Did HCPs explain to you why they were doing examinations or procedures?			
	Communication			
214	Did the HCPs explain to you why they were giving you any medicine?			

215	Did you feel you could ask the health care providers or other staff at the facility any questions you had?			
Supportive Care				
216	Did the health care providers at the facility talk to you about how you were feeling?			
217	Did the health care providers / other staff at the facility support your anxieties & fears?			
218	Do you feel the health care providers did everything they could to help control your pain?			
219	When you needed help, did you feel the health care providers or other staff at the facility paid attention?			
220	Were you allowed to have someone you wanted (outside of staff at the facility, such as family or friends) to stay with you during labor delivery?			
Trust				
221	Did you feel the HCPs or other staff at the facility took the best care of you?			
222	Did you feel you could completely trust the HCPs or other staff at the facility with regards to your care?			
Facility environment/Organization				
223	Do you think there was enough health staff in the facility to care for you?			
224	Thinking about the labor and postnatal wards, did you feel the health facility was crowded?			
225	Thinking about the wards, washrooms and the general environment of the health facility, will you say the facility was very clean, clean, dirty, or very dirty?			
226	Was there water in the facility?			
227	Was there electricity in the facility?			
228	In general, did you feel safe in the health facility?			
Section 3. General social support scale				
There are times in our lives when we need help, encouragement, and advice from people we know. This help can be given by a spouse, family members, friends, neighbors, or other members of your community. I would like to ask you questions about the different kinds of help you receive.				
301	Do you get visits from your friends, neighbors, and relatives during delivery and PNC	N	Yes	
302	Do you get useful advice (from partner, family members, friends, neighbors, other members of your community) about important things in your life?	N	Yes	
303	Do you get to talk with someone (like your partner, family members, friends, neighbors, or other members of your community) you trust about your personal and family problems?	N	Yes	
304	Do you have people who care about what happens to you or would you like to have people who care about you?	N	Yes	
305	Do you feel loved by your family?	N	Yes	
306	Do your partner and family tell or show you that they are thankful for the things you do for your family?	N	Yes	
307	Do you get help with your household chores or would you like to get help with chores?	N	Yes	
308	Do you get help with money in an emergency or like to have someone to help you?	N	Yes	
309	Does anyone help you or would you like someone to help when you need transportation?	N	Yes	
310	Do you get cared or would like to be cared for when you are sick?	N	Yes	

Thank you for your time!!!!!

Annex IV: Questionnaire Afaan Oromoo version

Yuunbarsiitii Jimmaatti

Koolleejjii Fayyaa Hawwaasaa

Muummee Hawwaasummaa Fi Fayyaa Maatii

Dabalee V: Odeeffannoo guutuu hirmaattoota qorannichaaf

Mataduree Qorannichaa: Haala itti fayyadama tajaajila fayyaa haadholii walitti fufiinsaa (yeroo ulfaa, da'umsaa fi da'umsa boodaa) fi bu'aa inni da'umsa irratti qabu "akka Godina Jimmmaatti

Barbaachisummaa fi Seen- duubee qorannichaa

Haloo: Akkam bultan/ooltan/jirtu?

Ani maqaan koo_____, isin qorannoo "**Haala itti fayyadama tajaajila fayyaa haadholii walitti fufiinsaa [yeroo ulfaa, da'umsaa fi da'umsa boodaa] fi bu'aa inni da'umsa irratti qabu** "akka Godina Jimmmaatti jedhu, kan barataa digrii sadaffaan [PhD] gaggeeffamu kana keessatti akka hirmaattaniif afeeramtaniittu. Kunis kan filatamtan haala itti fayyadama tajaajila fayyaa haadholii walitti fufiinsaa yeroo ulfaa, da'umsaa fi da'umsa boodaa fi Bu'aa inni da'umsa irratti qabu wal qabatee waa'ee hawaas- diinagdee, muuxannoo fi beekumsa keessan kan yeroo darbee fi ammaa irratti akka nuuf qooddaniif

Barbaachisummaa qorannichaa

Kaayyoon qorannoo kanaa haala itti fayyadama tajaajila fayyaa haadholii walitti fufiinsaa (yeroo ulfaa, da'umsaa fi da'umsa boodaa) fi bu'aa inni da'umsa irratti qabu irratti ragaa maddisisuudha, isinis akka keessatti hirmaattaniif kan affeeramtan carraan waan isin qaqqabeef. Qorannoon kunis akka Godina Jimmaatti aanaa Deedoo fi Oomoo Naaddaatti kan gaggeeffamuu fi odeeffannoonis kan funaanamu gaaffii fuulaa-fuulatiin ta'a

Miidhaa fi Bu'aawwan qorannichaan wal-qabatan

Akka hirmaataa qorannoo kanaatti gartuu geggeessitoota qorannoo kana waliin waa'ee haala itti fayyadama tajaajila fayyaa haadholii walitti fufiinsaa [yeroo ulfaa, da'umsaa fi da'umsa boodaa] fi bu'aa inni da'umsa irratti qabu irratti mari'achuuf carraa argachuu keessaniin ala hirmaachuu keessaniif kallattiidhaan faayidaan jiraachuu baattanis, odeeffannoon walitti qabamuu hudhaawwan itti fayyadama tajaajila fayyaa haadholii yeroo ulfaa, da'umsaa fi da'umsa boodaa fi bu'aa inni da'umsa irratti ragaa walitti qabuun yaada furmaataa kaa'uuf, yaala fooyya'aa akka argattan ykn itti fayyadamanii fi tajaajila fooyya'aa akka argattan gochuuf . Qorannoo kana keessatti hiramaachuu keessaniin wal qabatee tarii yeroo gaaffii fi deebii kana yeroo keessan isi irraa fudhachuu ykn isinitti toluu dhiisuu danda'a, yoo rakkoon /miirri akkasii jiraates nu beeksisaa

Iccitii fi Odeeffannoo dhuunfaa (Eenyuu faatuu odeeffannoo kana argachuu danda'a)

Odeeffannoon dhimma qorannoo kanaaf funaanaman kamuu haala naamusa qabuun kaa'amu. Odeeffannoon hundi ibsituu eenyummaa hin qabaatan, iccitaanis olkaa'amu. Qorannichi kuni haala ser-qabeessaan adeemsifamaa jiraachuu isaa mirkaneessuuf Dursaa/tuu Koree Naamusa Qorannoo Yuunbarsiitii Jimmaatti, Inistituutii Fayyaa [Dr.Nastaanat Warqinaa karaa toora bilbilaa: 0917762109] quunnamuun ni danda'ama. Akkasumas namootni biroo yoo dhimma seeraaf barbaadan haala barbaadameen odeeffannoon keessan sakattaa'amuu ni danda'a. Odeeffannoon kun koonfiraansiwwan garaagaraa irrattii ykn maxxansaan fayyadamuu ni dandaa'ama garuu ibsituun eenyummaa keessanii hin ibsamu.

Keessatti hirmaachuun fedhiin ta'uu isaa

Qorannoo kana keessatti akka hirmaattaniif eenyullee isin hin dirqisisu. Amma keessatti hirmaachuuf murteessitanillee yoo yaada keessan jijjiirattan, yeroo feetanitti addaan kutuu ni dandeessu. Kanaafis, miidhaas ta'e waan duratti argachuu maltan osoo hin dhabiin qorannichaa keessatti hirmaachuu dhiisuu ni dandeessu.

Odeeffannoo dabalataaf **Seenaa Balinaa** karaa toora bilbilaa armaan gadii quunnamuun ni dandeessu

- T: +251 912112666, E: senabalina26@gmail.com or sena.belina@ju.edu.et

Dabalee VI: Guca waliigaltee hirmaattota qorannichaaf

Seensa

Osoo qorannicha keessatti hirmaachuu keessan hin murteessin dura barbaachisummaa Qorannichaa, miidhaa, fi faayidaa isaa sirriitti hubachuu qabdan. Guci kunis odeeffannoo guutuu waa'ee Qorannichaa kan ibsuudha, tarii jechoota isinif ifa hin ta'in, isin hin beekne itti fayyadamneerra ta'uu danda'a. Kanaaf, guca kana erga sirriitti dubbistanii booda gaaffii yoo qabaattan, wantootni ifa hinta'in yoo jiraatan geggeesitoota qorannichaa gaafadhaa, isaan waliin mari'adhaa. Osoo keessatti hirmaachuu keessan hin murteessin dura guca kana fudhattanii deemuun waa'ee qorannichaa nama feetan mari'achiisuu ni dandeessu. Qorannoo kana keessatti akka hirmaattaniif eenyullee isin hin dirqisisu. Amma keessatti hirmachuuf murteessitanillee yoo yaada keessan jijjiirtan, yeroo feeitetanitti addaan kutuu ni dandeessu kanaafis, miidhaas ta'e waan duratti argachuu maltan osoo hin dhabni qorannichakeessatti hirmaachuu dhisuu ni dandeessu. Yoo keessatti hirmachuuf murteessitanii fi fedhii qabaattan guca waliigaltee kana galagalcha lamaan akka mallatteessitan kan gaafatamtan yoo ta'uu galgalcha tokko isinif kennama, fudhachuu hin dagatinaa!

Ani, kan armaan gadiitti mallatteessee, qorannoo "Haala itti fayyadama tajaajila fayyaa haadholii yeroo ulfaa, da'umsaa fi da'umsa boodaa fi Bu'aa inni da'umsa irratti qabu "akka godina Jimmmaatti jedhu irratti odeeffannoon barbaachisaa ta'e naaf keennamee , akka hubannaa koottii namanii uunka waliigaltee kana mallatteessee haala qorannichaa, waan qorannichi barbaadu, bu'aa fi miidhaa qorannichaa keessatti hirmaachuun narratti qabu beekee hubadhee mallattoo koo sirrii fi bilisaan kanan mallatteesse akka ta'ee nan mirkaneessa.

_____ _____ _____

Maqaa Nama waliigaltee Mallattoo Guyyaa: (GG -JJ- BBBB)

Dabalee VII: Afgaaffii

Yuunbarsiitii Jimmaatti
Koolleejjii Fayyaa Hawwaasaa
Muummee Hawwaasummaa Fi Fayyaa Maatii
Yuunbarsiitii Jimmaatti
Koolleejjii Fayyaa Hawwaasaa
Muummee Hawwaasummaa Fi Fayyaa Maatii

Kutaa 1 ffaa. Ibsituu Hirmaattuu			
Maqaa To'ataa/ttuu: _____		**Maqaa ragaa sassaabaa/duu: _____**	
Aanaa	2. Deedoo 2. O/ Naaddaa		
Maqaa	① Ganda _____ ① Zoonii_____		
Guyyaa gaaffiin itti gaggeeffame (gg/jj/wwww): _ / __ /____			
Kutaa 2ffaa: Gaaffiiwwan hawaas- diinagdee **Afgaaffii koo kanan eegalu waa'ee kee fi waa'ee maatii kee gaaffiiwwan muraasa sigaafachuun ta'a**			
Lak.	Gaaffilee	Deebii	Cee'umsa
201	Koodii abbaa warraa/manaa	[_____] lakkoofsaan	
202	Itti gaafatamummaa maatii keessatti	1. Haadha warraa 2. Gaggeessitu maatii [HH Head] 3. Kan biroo(barreessi) _____	
203	Umuriin keessan meeqa?	[_____] waggaadhaan	
204	Amantaa kamiin hordoftu? [Kanneen tarreeffaman hindubbisiniif]	1. Isilaama 2. Ortodoksii 3. Piroteestaantii 4. Waaqqeffataa 5. Kanneen biroo (barreessi) ____	
205	Sabummaa keessan	1. Oromoo 2. Amaaraa 3. Kafaa 4. Dawaaroo 5. Kanneen biroo [barreessi] ____	
206	Bakki jireenya keessanii	1. Magaalaa 2. Baadiyyaa	
207	Haala barnoota keessanii [Dubartii ulfaa]	[_____]Kutaan/ lakkoofsaan	
208	Hojii/Dalagaan keessan maali? [Dubartii ulfaa]	1. Qonnaa 2. Daldaltu 3. Hojjettuu mootummaa 4. Hojjettuu guyyaa 5. Kan biroo (Addeessi) _____	
209	Haala gaa'ela keessan yeroo ammaa (Kanneen tarreeffaman hindubbisiniif)	1. Gaa'ela horadheera 2. Wal hiikera 3. Narraa du'e 4. Kan bultii hin ijaarratin 5. Kanneen biroo [barreessi] ____	Yoo kan bultii hin ijaarratin ta'e > 214
210	Akaakuu/ haala gaa'ela keessanii yeroo ammaa	1. Nama tokko qofa kanfuudhe/ heerume 2. Nama tokko ol kanfuudhe/heerume	
211	Umuriin *abbaa warraa* keessan meeqa?	[_____] waggaadhaan 99. Hin yaadadhu	

212	Haala barnootaa *abbaa warraa* keessanii	[_____]Kutaan/ lakkoofsaan 99. Hin yaadadhu	
213	Hojii/dalagaa *abbaa warraa* keessanii	1. Qonnaa 2. Daldalaa 3. Hojjetaa mootummaa 4. Hojjetaa guyyaa 5. Kan biroo (Addeessi) _____	
214	Baay'ina maatii keessanii (Yoo warra 2 qabaattanis kan 2nuu bakka tokkotti)	Dimshaashatti:	Dhiira: Dhalaa:	
Kutaa 3ffaa: Qabeenya maatiin			
301	Horii armaan gadiitti tarreeffaman kanneen qabduu? 1. Saawwan /Sangoota /Korommii/jiboota 2. Faradoo/Harroota/Gangoolii 3. Re'oota/Hoolota 4. Kanneen biroo yoo jiraate [barreessi]	1. Eeyyee 0. Lakki 1. Eeyyee 0. Lakki 1. Eeyyee 0. Lakki	
302	Lafa qonnaa qabdu	1. Eeyyee, [_____] heektaara 0. Lakki	
303	Maatii kee keessaa biqiltuu/gujjii bunaa kan qabu jiraa?	1. Eeyyee, [_____] heektaara 0. Lakki	
304	Bu'uurri/lafti/ mana keessanii maal irraa tolfame? (Mirkaneefachuuf ilaali!)	1. Biyyee/ dhoqqee. 2. Simmintoo fi dhagaa 3. Kan biraa (addeessi)....	
305	Baaxiin mana keessanii maal irraa tolchame? (Mirkaneefachuuf ilaali!)	1. Caffee/ alaaduurra/citaa 2. Qorqoorroo irraa 3. Kan biraa (addeessi).....	
306	Maatiin kee wantoota armaan gadii ni qabuu? 1. Electrikaa 2. Soolaarii 3. Raadiyoonii 4. Televiziyoona 5. Telefoona harkaa 6. Siree afati isaa jirbii/ispoonjii irraa tolfame 7. Eelee humna ifaan biddeena tolchu 8. Istoovii gaaziin waa bilcheessu 9. Doqdoqqee 10. Konkolaataa 11. Baajajii 12. Gaarii fardaan ykn horii biroon harkifamu	1. Eeyyee 0. Lakki 1. Eeyyee 0. Lakki 1. Eeyyee 0. Lakki 1. Eeyyee 0. Lakki 1. Eeyyee 0. Lakki 1. Eeyyee 0. Lakki 1. Eeyyee 0. Lakki 1. Eeyyee 0. Lakki 1. Eeyyee 0. Lakki 1. Eeyyee 0. Lakki 1. Eeyyee 0. Lakki 1. Eeyyee 0. Lakki	
307	Maatiin kee nyaata isaanii bilcheeffachuuf madda anniisaa maaliitti fayyadamu? *(Deebiin isaa hedduu ta'uu ni mala)*	1. Electrikaa 2. Baa'oo gaazii 3. Naafxaa kiroosiinii 4. Qoraan 5. Cilee 6. Kan biroo (Addeessi)	
Kutaa 4ffaa: Haala wal hormaataa fi Itti fayyadama tajaajila fayyaa haadholii			
4.1 Haala wal hormaataa			
411	Hanga ammaatti yeroo meeqa ulfoofteetta?	[_____] lakkoofsaan 99. Hinyaadadhu	
412	Naqa/ yeroo meeqa nagaan oofkalte/deesse	[_____] lakkoofsaan 99. Hin beeku	

413	Daa'imni sirraa ba'ee beekaa [Abortion]	Eeyye…1 Lakki…0		
414	Daa'imni sijalaa du'ee/anii beekaa/kuu? [Osoo hin ga'iin kan dhalatan, dhalatten ykn yeroo baatii tokko keessattii kan du'e]	Eeyye…1 Lakki…0		
415	Ulfikee kan kana duraa waggaa meeqa dura ture?	[_____] waggaadhaan 99. Hinyaadadhu		
416	Wayita ulfa kee isa darbee [Maqaa daa'imaa] kunuunsa da'umsa duraa hordoftee turtee?	Eeyye…1 Lakki…0	Yoo lakkii ta'e >523	
417	Yoo hordofteetta ta'e [kunuunsa da'umsa duraa] eessatti? *[Deebiin isaa tokkoo ol ta'uu ni mala]*	1. Keellaa fayyaa 2. Buufata fayyaa 3. Hospitaala 4. Mana deessistuu aadaatiin 5. kan biraa barreessi		
418	Yoo hordofteetta ta'e [hordoffii da'umsa duraa] yeroo meeqa goote/dhaqxe?	[_____] lakkoofsaan 99. Hinyaadadhu		
419	Yeroo hordoffii fi kunuunsa da'umsa duraa eenyutu dura hordoffii kana siif taasise? [Deebiin isaa tokkoo ol ta'uu ni mala]	1. Ogeeyyii fayyaa 2. Deessistuu aadaa 3. Hojjetoota ikisteenshinii fayyaa 4. Hinyaadadhu		

420	Yeroo hordoffii da'umsa duraa keetii kana tajaajila akkamiitu siif kenname? *[Kanneen tarreeffaman hin dubbisiniif]*	Naaf ilaalameera/Kennameera	Eeyyee	Lakki	Hinyaadadhu
		1. Umurii ulfaa (Marsaa laguun)			
		2. Dhiibbaa dhiigaa			
		3. Kiiloo /Ulfatina			
		4. Hanqina dhiigaa			
		5. Hojjaa gadameessaa			
		6. Dhahannaa onnee			
		7. Gartuu dhiigakoo fi RH			
		8. Hgb [Hemogiloobiininii]			
		9. Fincaan			
		10. Talaallii [TT]			
		11. Fanxoo			
		12. Ayireenii			
		13. Qorichi raammoolee garaaf			
		14. Qorannoo HIV			
		15. Saaphana siree			
		16. Kan biraa (tarreessi) _____			

421	Yeroo hordoffii da'umsa duraa kanatti maal baratte/gorfamte? *[Kanneen tarreeffaman hin dubbisiniif]* *[Deebiin isaa tokkoo ol ta'uu ni mala]*	1. Yoomii fi yeroo meeqa hordofuu akkan qabu 2. Bakka fi qophii yeroo da'umsaa 3. Gorsa waa'ee mallattoolee balaa cimoo 4. Gorsa sirna nyaataa 5. Waa'ee harma hoosisuu 6. Haala itti fayyadama saaphana siree 7. Kan biraa (tarreessi) _____	
422	Yeroo ulfa kee darbee rakkoon si mudate ni jira turee?	Eeyyee…1 Lakki…0	Yoo lakkii ta'e >H421
423	Yoo deebiin kee Gaaffii 422, Eeyyee ta'e rakkoolee akkamiitu si mudate?	1. Dhangala'uu dhiigaa yeroo ulfaa 2. Waraansa cimaa garaa/ gadameessaa 3. Of wallaaluu	

	[Kanneen tarreeffaman hin dubbisiniif] *[Deebiin isaa tokkoo ol ta'uu ni mala]*	4. Mataa dhukkubbii cimaa 5. Dhaqni ho'uu 6. Afuursuu/ afuura kutuu 7. Kan biraa (tarreessi) _____ 99. Hinyaadadhu	
424	Deebiin kee #422, Eeyyee yoo ta'e tajaajila fayyaa argatteettaa?	Eeyyee…1 Lakki…0	
425	Deebiin kee #424, Eeyyee yoo ta'e tajaajila fayyaa eessaa argattan?	1. Keellaa fayyaa 2. Buufata fayyaa 3. Hospitaala 4. Kan aadaa 5. kan biraa barreessi	
426	Gara hospitaala olaanaatti ol-ergamtee /Rifeerii taatee?	Eeyyee…1 Lakki…0	

4.2 Hubannaa tajaajila kunuunsa da'umsa duraa

H421	Dubartootni ulfaa tajaajila kunuunsa da'umsa duraa hordofuu qabu	Eeyyee	Lakki	Hinbeeku
H422	Rakkoo yoo hin qabaanne iyyuu tajaajila da'umsa duraa hordofuu qabu			
H423	Dubartootni ulfaa tajaajila kunuunsa da'umsa duraa isa jalqabaa Ji'oota sadan jalqabaatti fudhachuu qabu			
H424	Tajaajila da'umsa duraa dafanii jalqabuun haadhas daa'imas ni fayyada			
H425	Yeroo ulfaa talaallii TT kennuun barbaachisadha			
H426	Dubartootni ulfaa yeroo ulfaa Ayireenii fudhachuu qabu			
H427	Yeroo ulfaa sirna nyaataa fooyyesuun guddina daa'imaaf murteessadha			
H428	Tajaajila da'umsa duraa yeroo afurii fi isaa ol fudhatamuu qabu			

Haala itti fayyadama Tajaajila fayyaa haadholii yeroo da'umsaa kan yeroo darbee

D431	Da'uumsa kee dhihoo eessatti deesse?	1. Manatti 2. Hospitaala 3. Buufata fayyaatti 4. Keellaa fayyaatti[extenshinii] 5. kanneen biroon yoo jiraatan ibsi	Yoo manatti ta'e gaaffii > D434
D432	Bakka itti deesse kana maaliin deemte?	1. Miillaan 2. Motooraan 3. Taaksiin 4. Kan biraa (tarreesi) _____	
D433	Bakka dura itti deesse ga'uuf hagam sirraa fagaata?	[_____] daqiiqaan 99. Hin yaadadhu	
D434	Bakka dura itti deesse kana maalif filatte?	1. Nagaan da'uu waanan barbaadeef 2. Yeroo ulfaa rakkoon waan tureef 3. Rakkoo fayyaa waanan qabuuf 4. Gorsa maatii/firootaa 5. Mana kootti dhihoo waan ta'eef 6. Kan biraa (tarreessi) _____	
D435	Da'umsa dhihootti deesse irratti eenyutu si gargaare? *[Kanneen tarreeffaman hin dubbisiniif]* *[Deebiin isaa tokkoo ol ta'uu ni mala]*	1. Ogeessa fayyaa 2. Deessistoota aadaa 3. Exteenshinii fayyaa 4. Maatii/hiriyaa/fira 5. kan biraan yoo jiraate ibsaa:	
D436	Akkamiin deesse	1. Nagumaan [SVD]	

		2. Opirasoonii[C/S]	
D437	Yeroo da'uumsaa rakkoon si mudatee turee?	Eeyyee…1 Lakki…0 99. Hin yaadadhu	Lakki > D4312
D438	Deebiin kee #D437, Eeyyee yoo ta'e rakkoolee akkamiitu si mudate? *[Kanneen tarreeffaman hin dubbisiniif]* *[Deebiin isaa tokkoon ol ta'uu ni mala]*	1. Ciniinsuu yeroo dheeraa[≥12hrs] 2. Dhangala'uu dhiigaa cimaa 3. Bishaan gubbee dafee dhangala'uu 4. Dhaqni ho'uu/daafqa 5. Kan biraa (tarreessi) _____ 99. Hin yaadadhu	
D439	Tajaajila fayyaa argatteettaa?	Eeyyee…1 Lakki…0	Lakki > D4312
D4310	Yoo tajaajila fayyaa argatteetta ta'e eessaa?	1. Keellaa fayyaa 2. Buufata fayyaa 3. Hospitaala 4. Kan aadaa 5. kan biraa barreessi	
D4311	Gara hospitaala olaanaatti ol-ergamtee?	Eeyyee…1 Lakki…0	
D5312	Yeroo da'uumsaa rakkoon daa'ima kee mudatee turee?	Eeyyee…1 Lakki…0 99. Hin yaadadhu	Yoo lakkii ta'e > H441
D4313	Deebiin kee #D4312 Eeyyee ta'e rakkoo akkamiitu mudate?	1. Osoo yeroon hin ga'in dhalate/tte 2. Du'aatu dhalate/tte 3. Kiiloon xiqqaadha 4. Dhalatee ka'ee du'e 5. kan biraa barreessi	

4.4.Hubannaa tajaajila kunuunsa yeroo da'umsaa				
H441	Dafanii rakkoo jiru adda baasuun, yalamuun fayyumaa haadhaa fi da'imaa akka eegamu godha	Ittin walii gala	Lakki	Hinbeeku
H442	Bakka qulqulluu fi mijataatti akka da'aan gochuu rakkoowan haadhas da'imaas mudachuu malan habisa			
H443	Dafanii harma hosisuu fi ji'a 6f harma qophaa hosisuu akka qaban ni hubatu			
H444	Kunuunsa dahumsa boodaaF gara dhaabbata fayyaa deemuu akka qabdu akka hubattu carraa uumaaf			
H445	Haati kamuu rakkoo yoo hin qabaanne iyyuu gargaarsa ogeeyyii fayyaatiin mana yaalaatti da'uu qabdi			

4.5.Haala itti fayyadama Tajaajila fayyaa haadholii fi daa'imaa da'umsaan boodaa			
P450	Yoo dhaabbata fayyaatti kan deesse ta'e eega (*maqaa*) deessee booda hagamiif achi turte?	1. Sa'a 24 gadiif 2. Sa'a 24 fi sanaa oliif 99. Hinyaadadhu	Gaaffii D431 wal simuu qaba
P451	Eega (maqaa) deessee booda namni haala fayyaa kee dhufee si ilaale jiraa?	Eeyyee…1 Lakki…0 99. Hin yaadadhu	
P452	Eega deessee manatti galtee ykn manatti deessee booda tajaajila fayyaa da'uumsaan boodaa gootee?	Eeyyee…1 Lakki…0 99. Hinyaadadhu	*Lakki > P457*
P453	Yoo deebiin kee gaaffii "P452 Eeyyee" ta'e naqa meeqa taasifte?	[_____] lakkoofsaan 99. Hinyaadadhu	
P454	Yoo deebiin kee gaaffii "P452 Eeyyee" ta'e tajaajila da'uumsaan boodaa 1ffaa eessatti fudhatte?	1. Hospitaala /Buufata fayyaa 2. Keellaa fayyaa 3. Manatti extenshiinii fayyaan 4. kan biraa barreessi	

P455	Yoo deebiin kee gaaffii "P452 Eeyyee" ta'e bakka itti tajaajila da'uumsaan boodaa 1ffaa fudhatte maaliin deemte?	1. Miillaan 2. Motooraan 3. Taaksiin 4. Kan biraa (tarreesi) _	
P456	Bakki tajaajila da'uumsaan boodaa 1ffaa itti fudhatte hagam sirraa fagaata?	[_____] daqiiqaan 99. Hin yaadadhu	
P457	Torbanoota ja'an jalqabaa keessatti rakkoon si mudate turee?	Eeyyee…1 Lakki…0 99. Hin yaadadhu	Yoo Lakki ta'e >P4511
P458	Yoo deebiin kee gaaffii "P457 Eeyyee" ta'e tajaajila fayyaa argatteettaa?	Eeyyee…1 Lakki…0	
P459	Yoo tajaajila fayyaa argatteettaa ta'e eessaa?	1. Hospiitaala /Buufata fayyaa 2. Keellaa fayyaa 3. Manatti deessistuu aadaan 4. Manatti extenshiinii fayyaan 5. kan biraa barreessi___	
P4510	Gara hospitaala olaanaatti/Rifeerii taatee?	Eeyyee…1 Lakki…0	
P4511	Daa'imni kee (maqaa) yeroo dhalate/tte mallattooleen balaa cimaa irratti mul'ateeraa?	Eeyyee…1 Lakki…0 99. Hin yaadadhu	Yoo Lakki ta'e > H461
P4512	Yoo deebiin kee gaaffii "P4511 Eeyyee" ta'e mallattooleen balaa cimaa irratti mul'atan waan akkamiiti?	1. Baayyee xiqqaa 2. Rakkoo sirna hargansuu 3. Ho'ina qaamaa 4. Qaamni isaa xofxof jechuu 5. Baayyee of dadhabuu 6. Addaachuu/Keelloo ta'uu 7. Hin boo'u 8. kan biraa barreessi	
P4513	Tajaajila fayyaa argatteettaa?	Eeyyee…1 Lakki…0	
P4514	Yoo tajaajila fayyaa argatteetta ta'e eessaa?	1. Hospiitaala /Buufata fayyaa 2. Keellaa fayyaa 3. Manatti extenshiinii fayyaan 4. Manatti deessistuu aadaan 5. kan biraa barreessi___	

4.6 Hubannaa tajaajila da'umsa boodaa

H461	Waa'ee fayyummaa haadholii fi da'immanii hubachiisuuf gargaara	Ittin walii gala	Lakki	Hinbeeku
H462	Rakkoowan balaa tasaa yeroo da'umsa boodaa dafanii adda baasuun yaaluuf rakkoowan walxaxoo kan biraa hambisuuf gargara			
H463	Dafanii harma hosisuu fi akka talalsiisaniif gargaara			
H464	Maatii akka waa'ee kunuunsa da'immaanii, tajaajila da'umsa boodaa fi karoora maatii barsiisnuu carraa huuma.			
H465	Eega da'anii manatti galanii /manatti da'anii booda tajaajila da'umsa boodaa hordofuu qabu			
H466	Dubartootni da'an hundu rakkoo yoo hin qabaannellee tajaajila da'umsa boodaa hordofuu qabu			

Galatoomaa!!!!

Yuunbarsiitii Jimmaatti
Koolleejjii Fayyaa Hawwaasaa
Muummee Hawwaasummaa Fi Fayyaa Maatii
Haala itti fayyadama Tajaajila fayyaa haadholii kan yeroo ammaa
Itti fayyadama tajaajila kunuunsa da'umsa duraa

Kutaa 1 ffaa. Ibsituu Hirmaataa/ttuu						
Maqaa To'ataa/ttuu	_____	**Maqaa ragaa sassaabaa/duu**_____				
Aanaa	1. Deedoo 2. O/ Naaddaa					
Maqaa	① Ganda _____ ① Zoonii_____Koodii abbaa warraa/manaa_____					
Guyyaa gaaffiin itti gaggeeffame (gg/jj/wwww): _ / __ /____						
Kutaa 2 ffaa. Haala itti fayyadama tajaajila fayyaa haadholii kan yeroo ammaa [Da'umsa duraa]						
Haala itti fayyadama tajaajila fayyaa da'umsa duraa irratti gaaffiiwwan armaan gadii isin gaafachuuf						
021	Tajaajila kunuunsa da'umsa duraa hordofaa jirtaa?	Eeyyee…1 Lakki…0		Lakki >029		
022	Yeroo tajaajila hordoffii da'umsa duraa eegalte ulfi kee turban meeqa ture?			_____[Torbeen]		
023	**Hordoffiilee da'umsa duraa 1ffaa,2ffaa, 3ffaa fi 4ffaa kan gaafatama**		**1ffaa**	**2ffaa**	**3ffaa**	**4ffaa**
	Hordoffii da'umsa duraa eessatti taasifte/hordofaa jirata? [1ffaa/2ffaa/ 3ffaa/4ffaa]	1. Keellaa fayyaa				
		2. Buufata fayyaa				
		3. Hospitaala				
		4. kan biraa barreessi				
024	Bakka itti hordofte [1ffaa/2ffaa/ 3ffaa/4ffaa] kana maaliin deemte?	1. Miillaan				
		2. Motooraan				
		3. Taaksiin				
		4. Kan biraa (tarreesi) _____				
025	Tilmaamaan bakki itti tajaajila kunuunsa da'umsa duraa [1ffaa/2ffaa/ 3ffaa/4ffaa] hordofte hagam sirraa fagaata? (Daqiiqaan)					
026	Yeroo hordoffii da'umsa duraa [1ffaa/2ffaa/ 3ffaa/4ffaa] kanatti tajaajilli/ qorannoon armaan gadii kun siif godhamee/ argattee? ▪ Lakki…0 ▪ Eeyyee…1 ▪ Hin barbaachisu….2 ▪ Hinyaadadhu…99.	1. Umurii ulfaa [Torbee meeqa akka ta'e]				
		2. Dhiibbaan dhiigaa				
		3. Ulfaatina/Kiiloon				
		4. Mallattoo hanqina dhiigaa [pallor]				
		5. Amma/ hojjaa/ gadameessaa [Torbeen]				
		6. Dha'annaa onnee daa'imaa				
		7. Qorannoo boolii xiqqaa/ Fincaanii				
		8. Qorannoo fanxoo				
		9. Qorannoo dhiigaa [Hemogiloobiininii]				
		10. Qorannoo gartuu dhiigaa				
		11. Talaallii titanosii [TT]				
		12. Ayireenii				
		13. Qorichi raammoolee garaaf				
		14. Qorannoo HIV				
		15. Kan biraa (tarreesi) _____				
027	Yeroo hordoffii da'umsa duraa kanatti mee maal baratte/gorfamte?	1. Yoomii fi yeroo meeqa hordoffii gochuu akkan qabu				
		2. Waa'ee sirna nyaataa				
		3. Waa'ee mallattoolee balaa cimoo				
		4. Bakka itti da'uu qabu				
		5. Meeshaalee da'umsaaf qopheeffachuu qabu				

	Lakki…0 Eeyyee…1 Hin barbaachisu.2 Hinyaadadhu…99	6. Qophii yeroo da'umsaaf qophaa'amuu qabu				
		7. Gorsa waa'ee sirna nyaataa daa'imaa				
		8. Waa'ee harma hoosisuu				
		9. Waa'ee karoora maatii				
		10. Waa'ee saaphana siree, busaa ittisuuf				
		11. Gorsa yoomi deebi'uu akkan qabu irratti				

028	Tajaajila da'umsa duraa hundumaa (yeroo 4) hordoftee?	Eeyyee…1 Lakki…0	Lakki >029

Tajaajila kunuunsa da'umsa duraa hordofuuf haalawwa rakkisoo/gufuu ta'an

029	Tajaajila kunuunsa da'umsa duraa kee hordofuu maalif hin hordofne/ addaan kutte? *[Rakkoowwan kanneen akka haala teessuma lafaa, haala qilleensaa, duudhaa hawwaasaa]*	1. Gara dhaabbilee fayyaa deemuun hin barbaachisu	**Itti waliin gala**	**Itti walii hin galu**
		2. Tajaajilli kennamu duudhaa hawwaasaa kan eege miti		
		3. Abbaan warraa koo naaf hin hayyamu		
		4. Nama na geessu /waliin deemu hin qabu		
		5. Abbaan warraa koo na hin tumsu		
		6. Ogeessotni dubraa waan hin jirreef		
		7. Ogeessota fayyaatti amanamummaa dhabuu		
		8. Dhaabbileen fayyaa cufaa ta'uu		
		9. Fageenya / geejjibni dhibamuu		
		10. Bu'aa ba'ii teessuma lafaa dadhabuu		
		11. Qarshiin heddummachuu		
		12. Tajaajilli kennamu qulqullina dhabuu		
		13. Aadaa fi duudhaa gaggeeffachuun hayyamamuu dhabuu		
		14. Yeroon tajaajilli itti kennamu mijataa ta'uu dhabuu		
		15. Kan biraa (tarreessi) _____		

030	Yeroo ulfa kee kana rakkoon si mudate ni jira turee?	Eeyyee…1 Lakki…0	Lakki >xummuri

031	Yoo deebiin kee **G 020**, Eeyyee ta'e rakkoolee akkamiitu si mudate?	1. Dhangala'uu dhiigaa yeroo ulfaa	Eeyyee…1	Lakki…0
		2. Waraansa cimaa garaa/ gadameessaa		
		3. Of wallaaluu		
		4. Mataa dhukkubbii cimaa		
		5. Dhaqni ho'uu/layidaa		
		6. Afuursuu/ afuura kutuu		
		7. Kan biraa (tarreessi) _____		

032	Tajaajila fayyaa argatteettaa? Eeyyee…1 Lakki…0			
033	Yoo tajaajila fayyaa argatteetta ta'e eessaa?	1. Keellaa fayyaa		
		2. Buufata fayyaa		
		3. Hospitaala		
		4. Kan aadaa		
		5. kan biraa barreessi		
034	Rifeerii taatee/ciiftee yaalamtee? Eeyyee…1 Lakki…0			

Galatoomaa!!

Yuunbarsiitii Jimmaatti
Koolleejjii Fayyaa Hawwaasaa
Muummee Hawwaasummaa Fi Fayyaa Maatii
Haala itti fayyadama Tajaajila fayyaa haadholii kan yeroo ammaa Itti fayyadama tajaajila da'umsaa

Kutaa 1 ffaa. Ibsituu Hirmaataa/ttuu			
Maqaa To'ataa/ttuu		Maqaa ragaa sassaabaa/duu	
Aanaa:	1. Deedoo 2. O/ Naaddaa		
Maqaa:	① Ganda _____ ① Zoonii_____Koodii abbaa warraa/manaa_____		
Guyyaa gaaffiin itti gaggeeffame (gg/jj/wwww): _ / __ /____			
2.Haala itti fayyadama tajaajila fayyaa haadholii kan yeroo ammaa [Da'umsaa]			
Haala itti fayyadama tajaajila fayyaa yeroo da'umsaa irratti gaaffiiwwan armaan gadii isin gaafachuuf			
201	Da'uumsa [maqaa daa'imaa] kee dhihoo eessatti deesse?	1. Manatti 2. Hospitaala 3. Buufata fayyaatti 4. Keellaa fayyaatti 5. kanneen biroon yoo jiraatan ibsi	Yoo manatti ta'e gara gaaffii **204** deemi
202	Bakka itti deesse kana maaliin deemte?	1. Miillaan 2. Motooraan 3. Taaksiin 4. Kan biraa (tarreesi) _____	
203	Bakka itti deesse ga'uuf hagam sirraa fagaata?	[_____] daqiiqaan 99. Hinyaadadhu	
204	Akkamiin deesse	1. Nagumaan [SVD] 2. Opirasoonii	
205	Da'umsa dhihootti deesse (maqaa daa'imaa) irratti eenyutu si gargaare?	1. Ogeessa fayyaa 2. Deessistoota aadaa 3. Exteenshinii fayyaa 4. Maatii/hiriyaa/fira 5. kan biraan yoo jiraate ibsaa: _____	
206	Bakka itti deesse kana maalif filatte?	1. Nagaan da'uu waanan barbaadeef 2. Yeroo ulfaa rakkoon waan tureef 3. Rakkoo fayyaa waanan qabuuf 4. Gorsa maatii/firootaa 5. Mana kootti dhihoo waan ta'eef 6. Kan biraa (tarreessi) _____	
207	Yeroo da'uumsaa rakkoon si mudatee turee?	Eeyyee…1 Lakki…0 99. Hin yaadadhu	Lakki > **212**
208	Rakkoolee akkamiitu si mudate?	1. Ciniinsuu yeroo dheeraa[≥12hrs] 2. Dhangala'uu dhiigaa cimaa 3. Bishaan gubbee dafee dhangala'uu 4. Dhaqni ho'uu/daarqa 5. Kan biraa (tarreessi) _____ 99. Hin yaadadhu	
209	Tajaajila fayyaa argatteettaa?	Eeyyee…1 Lakki…0	*Lakki > **212***

210	Yoo tajaajila fayyaa argatteetta ta'e eessaa?	1. Keellaa fayyaa 2. Buufata fayyaa 3. Hospitaala (kan uummataa) 4. Hospitaala/ kilinika dhuunfaa 5. Kan aadaa 6. kan biraa barreessi	
211	Rifeerii taatee/ciiftee yaalamtee?	Eeyyee…1 Lakki…0 99. Hin yaadadhu	
212	Yeroo da'uumsaa rakkoon daa'ima kee mudatee turee?	Eeyyee…1 Lakki…0 99. Hin yaadadhu	Lakki >214
213	Deebiin kee **#212 Eeyyee** ta'e rakkoo akkamiitu mudate?	1. Osoo yeroon hin ga'in dhalate/tte 2. Du'aatu dhalate/tte 3. Kiiloon xiqqaadha 4. Dhalatee ka'ee du'e 5. kan biraa barreessi	

Tajaajila kunuunsa da'umsaa hordofuuf haalawwan rakkisoo/gufuu ta'an

214 Tajaajila da'umsaaf **dhaabbata fayyaa kan hindeemne yoo** ta'e maalif sitti fakkaata? *[Deebii* **gaaffii # 204 wal simuu qaba**]

	Eeyyee	Lakki	Hin beeku
1. Gara dhaabbilee fayyaa deemuun hin barbaachisu			
2. Tajaajilli kennamu duudhaa hawwaasaa kan eege miti			
3. Abbaan warraa koo naaf hin hayyamu			
4. Nama na geessu /waliin deemu hin qabu			
5. Abbaan warraa koo na hin tumsu			
6. Ogeessootni dubraa waan hin jirreef			
7. Ogeessota fayyaatti amanamummaa dhabuu			
8. Dhaabbileen fayyaa cufaa ta'uu			
9. Fageenya / geejjibni dhibamuu			
10. Bu'aa ba'ii teessuma lafaa dadhabuu			
11. Qarshiin heddummachuu			
12. Tajaajilli kennamu qulqullina dhabuu			
13. Akkaataan kenniinsa tajaajjilaa aadaa fi duudhaa naannoon kan wal sime miti			
14. Haalli kenniinsa tajaajjilaa saala kan giddugaleessa godhate miti			
15. Yeroon ciniinfuun namatti dhufu beekamaa ta'uu dhabuu			
16. Kan biraa (tarreessi) _____			

Galatoomaa!!!

Yuunbarsiitii Jimmaatti
Koolleejjii Fayyaa Hawwaasaa
Muummee Hawwaasummaa Fi Fayyaa Maatii
Haala itti fayyadama Tajaajila fayyaa haadholii kan yeroo ammaa Tajaajila da'umsa Boodaa

Kutaa 1 ffaa. Ibsituu Hirmaataa/ttuu				
Maqaa To'ataa/ttuu		Maqaa ragaa sassaabaa/duu		
Aanaa	1. Deedoo 2. O/ Naaddaa			
Maqaa	① Ganda _____ ① Zoonii_____Koodii abbaa warraa/manaa_____			
Guyyaa gaaffiin itti gaggeeffame (gg/jj/wwww): _ / __ /____				
2.Haala itti fayyadama tajaajila fayyaa haadholii kan yeroo ammaa [Da'umsa boodaa]				
Haala itti fayyadama tajaajila fayyaa yeroo da'umsa boodaa irratti gaaffiiwwan armaan gadii isin gaafachuuf				
201	Eega (**maqaa daa'imaa)** deessee booda namni haala fayyaa kee dhufee si ilaale jiraa?	Eeyyee…1 Lakki…0		
202	Eega deessee manatti galtee booda ykn manatti deessee tajaajila fayyaa da'uumsaan boodaa taasifame/argatte?	Eeyyee…1 Lakki…0	*Yoo Lakki ta'e > 208*	
203	Yoo deebiin kee gaaffii "**202 Eeyyee"** ta'e eessatti?	1. Hospitaala /Buufata fayyaa 2. Keellaa fayyaa 3. Manatti extenshiinii fayyaan 4. kan biraa barreessi		
204	Maalif fuchuu barbbaadde?	1. Ilaalamuu waanan barbaadeef 2. Waa'ee fayyumaa koo waanan dhiphadhuuf 3. Gorsa ogeeyyii fayyaa argachuuf 4. Gorsa maatii/firootaa argachuuf 5. Kan biraa (tarreessi) _____		
205	Yoo deebiin kee gaaffii "**202 Eeyyee"** ta'e maaliin deemte?	1. Miillaan 2. Motooraan 3. Taaksiin 4. Kan biraa (tarreesi) _____		
206	Yoo deebiin kee gaaffii "**202 Eeyyee"** ta'e tilmaamaan bakki itti tajaajila da'umsa boodaa taasifte hagam sirraa fagaata?	[_____] daqiiqaan 99. Hinyaadadhu		
207	Yoo deebiin kee gaaffii "**202 Eeyyee"** ta'e tajaajila fayyaa da'uumsaan boodaa hundumaa taasifte**(Arfanuu)**	Eeyyee…1 Lakki…0	Yoo **Eeyyee** ta'e > 209	
208	**Tajaajila da'umsaa boodaa kan hindeemne / hundumaa hin taasifne yoo ta'e maalif sitti fakkaata?** [Rakkoowwan kanneen akka haala teessuma lafaa, haala qilleensaa, duudhaa hawwaasaa]			

	Eeyyee	Lakki	Hin beeku
1. Rakkoon yoo hin jirre dhaabbilee fayyaa deemuun hin barbaachisu			
2. Tajaajilli kennamu duudhaa hawwaasaa kan eege miti			
3. Abbaan warraa koo naaf hin hayyamu			
4. Nama na geessu /waliin deemu hin qabu			
5. Abbaan warraa koo na hin tumsu			
6. Daa'ima waliin deemuu hin danda'u			
7. Ogeessota fayyaatti amanamummaa dhabuu			
8. Dhaabbileen fayyaa cufaa ta'uu			
9. Fageenya / geejjibni dhibamuu/ bu'aa ba'ii teessuma lafaa			
10. Qarshiin heddummachuu			
11. Tajaajilli kennamu qulqullina dhabuu			

	12. Rakkoon osoo hin jirre deemuun duudhaa naannoo miti			
	13. Aadaa fi duudhaan naannoo naaf hin hayyamamuu			
	14. Kan biraa (tarreessi)			
209	Eega (maqaa daa'imaa) deessee booda rakkoon si mudatee turee?	Eeyyee…1 Lakki…0 99. Hinyaadadhu ____		Yoo Lakki ta'e > 213
210	Yoo deebiin kee **Gaaffii 209, Eeyyee** ta'e rakkoolee akkamiitu si mudate?	1. Dhaqni ho'uu 2. Dhadhabuu/suu 3. Dhangala'uu dhiigaa cimaa 4. Rakkoo afuffee fincaanii 5. Daarqa harmaa 6. Kan biraa (tarreessi) _____		
211	Tajaajila fayyaa argatteettaa?	Eeyyee…1 Lakki…0		
212	Yoo tajaajila fayyaa argatteettaa ta'e eessaa?	1. Hospiitaala /Buufata fayyaa 2. Keellaa fayyaa 3. Manatti extenshiinii fayyaan 4. Manatti deessistuu aadaan 5. kan biraa barreessi___		
213	Daa'imni kee (maqaa daa'imaa) yeroo dhalate/tte mallattooleen balaa cimaa irratti mul'ateeraa?	Eeyyee…1 Lakki…0 99. Hinbeeku/ yaadadhu		Yoo Lakki ta'e > 215
214	Daa'imni kee (maqaa daa'imaa) yeroo dhalate/tte mallattooleen balaa cimaa irratti mul'ateera yoo ta'e waan akkamiiti?	1. Baayyee xiqqaa 2. Rakkoo sirna hargansuu 3. Ho'ina qaamaa 4. Qaamni isaa xofxof jechuu 5. Baayyee of dadhabuu 6. Addaachuu/Keelloo ta'uu 7. Hin boo'u 8. kan biraa barreessi		
215	Dhalatee (**maqaa daa'imaa**) torbanoota ja'an jalqabaa keessatti rakkoon fayyaa mudate turee?	Eeyyee…1 Lakki…0 99. Hinbeeku/ yaadadhu		Yoo Lakki ta'e > **G101**
216	Rakkoolee akkamiitu si mudate? (maqaa daa'imaa) [Kanneen tarreeffaman hin dubbisiniif] [Deebiin isaa tokkoon ol ta'uu ni mala]	1. Ho'a qaamaa 2. Garaa kaasaa 3. Ol deebsaa 4. Madaa nafa irratti 5. Baay'ee boo'uu 6. Qufaa 7. Qaamni Addaachuu/Keelloo, ta'uu 8. Ulfaatina qaamaa dabaluu dhabuu 9. Kan biraa (tarreessi) _____		
217	Tajaajila fayyaa argatteettaa?	Eeyyee…1 Lakki…0		Lakki >**219**
218	Yoo tajaajila fayyaa argatteetta ta'e eessaa?	1. Hospitaala / Buufata fayyaa 2. Keellaa fayyaa 3. Manatti extenshiinii fayyaan 4. kan biraa barreessi___		
219	Tajaajila fayyaa erga argatteetta boodahoo maal ta'e/outcome		1. Ni fooyya'e 2. Ni booqote	

Gaaffilee waliigalaa

Kutaa 1ffaa. Murteessummaa /murtoo kennuu			
101	Dhaabbata fayyaa deemtee tajaajila fayyaa yeroo [**ulfaa, da'uumsaa fi da'uumsa boodaa]** fayyadamuuf haala kamiin murteeffatta?	1. Qofaa 2. Abbaa warraa koo waliin 3. Nama biraa waliin. 4. Abbaa warraa kootu naaf murteessa	
102	Dhaabbata fayyaa deemtee ijoolleen kee tajaajila fayyaa **[talaallii, dhibee waan biroo**] akka argataniif haala kamiin murteeffatta?	1. Qofaa 2. Abbaa warraa koo waliin 3. Nama biraa waliin. 4. Abbaa warraa kootu naaf murteessa	
103	Dhimma maatii kee irratti eenyutu murteessa?	1. Qofaa 2. Abbaa warraa koo waliin 3. Nama biraa waliin. 4. Abbaa warraa kootu naaf murteessa	

Kutaa 2ffaa. Tajaajila fayyaa haadholii giddu- galeessa godhate (PCMC)					
201	Turtii yeroo tajaajila argachuuf sitti fudhate akkamitti ilaalta	Tajaajila	Baay'ee gabaabaa	Amma tokko dheeraa	Baay'ee dheeraa
		D/duraa			
		Da'umsaa			
		D/boodaa			

PCMC		Eeyyee	Lakki	Hinyaadadhu
201	**Kabajaan na tajaajilaniiru** jettanii yaadduu?			
202	**Haala naatoo [**friendly**] qabuun na tajaajilaniiru** jettanii yaadduu?			
203	Natti **iyyaa, abaaraa, doorsisaa, tuffachaa** na **tajaajilan** jettanii yaadduu?			
204	Seer-malee **rukutamaa, qimmiidamaan… tajaajilame** jettanii yaadduu?			
205	Yeroo **qorannoo qaamaa isiniif** godhan qaama keessan akka malee akka hin mul'anneef **girdoo/maggaarrajaa** fayyadamaniiruu jettanii yaadduu?			
206	Odeeffannoon fayyaa **keessan iccitaan naaf** qabameera jettanii yaadduu?			
207	Yeroo isin tajaajiluu dhufan ogeeyyiin fayyaa **of isin beeksiisu** turanii?			
208	Ogeeyyiin fayyaa maqaa keessaniin isin waamu turanii?			
209	Tajaajila isiniif godhamuu **murteessuu keessatti** na hirmaachisaniiru jettanii yaadduu?			
210	Yeroo qorannoos ta'ee yaala biroof **hayyama keessan** ni gaafatu turanii?			
211	Yeroo da'umsaa **haala barbaaddaniin** waan deessan isinitti fakkaata?/position			
212	**Afaan isin** hubachuu dandeessaniin walii galu turanii?			
213	Qorannoos ta'e yaala biroo isiniif gochuu/ kennuun dura **maal akka godhan isiniif ibsu turani**i?			
214	Qoricha isiniif kennuu dura **maalif akka kennamu** isiniif ibsu turanii?			
215	**Gaaffii kamiinuu** gaafachuu nan danda'a jettanii yaadduu?			
216	Gargaarsa **isiniif malu hundumaa** naaf kennaniiru jettanii yaadduu?			
217	Waa'ee **yaaddoo fi sodaa** keessaniif isin deggeru/ jajjabeessu turanii?			

218	**Dhukkubbii** keessaniif wantoota malan hundumaa naaf godhaniiru jettanii yaadduu?			
219	Yeroo barbaaddanitti **xiyyeeffannoo** naaf kennaniiru jettanii yaadduu?			
220	Yeroo ciniinsuu/ da'uumsaa namni akka isin waliin ta'uf barbaaddan akka isin waliin turuuf isinii hayyamamee turee?			
221	Akka isaan isin tajaajilaniif **guutumaan guutuutti isaan amantu** turtanii?			
222	Dhaabbaticha keessa **ogeeyyii fayyaa ga'oon** jiru jettanii yaadduu?			
223	Ogeeyyii fayyaa kutaa keessa turtan walitti**-baay'eedha** jettanii yaadduu?			
224	Kutaan dhaabbata fayyaa keessa turtan **qulqullina** qaba jettanii yaadduu?			
225	Dhaabbaticha keessa **bishaan** ni jira turee?			
226	Dhaabbaticha keessa **ibsaan** ni jira turee?			
227	Walumaagalatti **dhaabbatichi mijataadha** jettanii yaadduu?			

Kutaa 3ffaa: Haala wal-deggersa hawwaasummaa

Jiruu fi jireenya keenya keessatti yeroo tokko- tokko yeroo nuti deggersa, gorsaa fi jajjabina adda addaa namoota beeknu irraa barbaannu ni jira. Deggersi kunis abbaa warraa/haadha warraa, maatii, ollaa, firoottanii, hiriyaa fi kkf irraa ta'uu danda'a. Gaaffiiwwan ani armaan gadiitti isin gaafadhu kunneen waa'eedhuma qaphxiilee kanneeniiti.

301	Hiriyyootni, firootni fi oollaan [**kanneen si waliin bakka tokko hin jiraatne**] kee dhufanii si ilaalaniiruu?	Eeyyee	Lakki
302	Jiruu fi jireenya kee keessatti gorsa jireenya keetiif si barbaachisu ollaa, maatii, hiriyyaa, fira, abbaa warraa fi hawaasa naannoo kee irraa ni argattaa?		
303	Namoota amantu kanneen akka abbaa warraa, hiriyaa, oollaa, fi firoota waa'ee dhimma dhuunfaa fi maatii keetii waliin mari'achuuf hiree/carraa qabdaa?		
304	Yeroo waan tokko rakkattu nama dafee si dhaqqabu/ siif dhimmu qabdaa?		
305	Waa'ee maatii keetii jaalalli sitti dhagahamaa?		
306	Wantoota ati maatii keetiif /abbaa warraa keetiif gootuuf si galateeffatu jettee ni yaaddaa??		
307	Hojiiwwan hojjettu keessatti gargaarsa yoo barbaadde ni argattaa?		
308	Yeroo balaan tasaa si mudatutti gargaarsa yoo barbaadde ni argattaa?		
309	Geejjiba yoo barbaadde nama biraarraa deggersa ni argattaa?		
310	Yeroo dhukkubsattu kunuunsi akka siif godhamu yoo barbaadde ni argattaa?		

Galatoomaa!!!!

Annex VIII: Qualitative interview guides

Background information

Healthcare providers	
Age in year	
Sex	
Marital status	
Region	
Educational Level	
Profession	
Year of experience	
Participant position	
District	
Organization/ PHCU	
Start time	Finish time

1. How do you perceive the general MHC status of the community in this Woreda?
2. How would you describe the MHC utilization (practices) status in your catchment areas?
   - Do women in this community go for ANC, ID and PNC?
   - When do they usually start and how frequently they go for ANC and PNC?
   - Do all eligible pregnant women attend ANC?
   - Is the achievement of skilled delivery in line with the eligibility for the month?
   - Do all mothers who attended ANC also go for ID and PNC?
   - Why do most mothers seek ANC but not ID and PNC?
   - What are the unique characteristics of the women who use MHC in this community?
3. How do you see the communities and or women's attitude, and beliefs about MHC?
   - What do they like/dislike about going health institution for MHC?
   - What are the perceived community's benefits towards using MHC?
   - How do you see perception of men/partners towards MHC? Explore any norms, culture, beliefs and values known to the men about MHC
4. How do you see the knowledge and level of awareness of the communities in general and women in particular towards MHC?

- Are women in the community know the benefits of using MHC?
- Do women in these communities go for health facilities by their own decision?

5. Reinforcing factors. How do you see the availability and accessibility of MHC services for women?

   Explore for barriers or facilitators such as;

   - Do they have easy access to the facilities in terms of availability, affordability, and accessibility?
   - What are the societal factors involved, such as beliefs, social norms, behaviors, and cultural practices?
   - What are the health worker factors, such as knowledge, skills, respect, communication, assurance, empathy, and commitment?
   - Are there any health system barriers, such as workload, supervision, availability of equipment, supplies, infrastructure, human resource development, governance, and culture-sensitive approaches?

6. How do women in the community influence each other? [Social networking mechanism)
   - Are there any community networking mechanisms where pregnant women, lactating mothers and or other community members share their ideas, or getting support, or helping each other's on MHC?

Wrapping up

We have discussed a lot of issues. Is there anything else you would like to tell us?

Thank you for your participation!

Pregnant woman	
Age in year	
Sex	
Marital status	
Region	
Educational Level	
District	
Start time	Finish time

1. Do pregnant women in this communities visit health facilities for MHC (ANC, ID and PNC) checkups? Why?
   - When do they usually start and how frequently they go for ANC?
   - Why some mothers do seek MHC and others don't?
   - Why most mothers do seek ANC but don't ID and PNC?
   - How do you see the attitude of the women in this community towards MHC?
   - What do they like/dislike about going health institution for MHC?
   - What are the perceived benefits of using MHC that women in this community talks?
   - How do you see perception of men/partners towards MHC services? Is there any norms, culture, beliefs and values known to the men about MHC
2. How do you see the knowledge and awareness level of women towards MHC?
3. How do you see the availability and accessibility of MHC services for women?

   Explore for barriers or facilitators such as;
   - Do they get access to the facilities as easily as possible (availability of the services , affordability /cost for MHC, accessibility)
   - Health workers behaviors
   - Unfriendliness of services
   - Lack of privacy/confidentiality
   - Health system barriers (skills of providers, availability, respect, communication, empathy, culture sensitive approaches, health care providers commitment)
   - Common beliefs, norms, cultural practices facilitating or barriers for MHC uses?
   - Could you tell us other stories you may personally experience or came across?

We have discussed a lot of issues. Is there anything else you would like to tell us?

Thank you for your participation!

Annex IX: CV of the student

- Full name Sena Belina Kitila
- Nationality Ethiopian
- Date of birth 1984, west Wallaga
- Sex Male
- Marital status married
- Position: Asst Professor
- Organization: Jimma University, School of Nursing

- Contact address Telephone(s): +251912112666
- E-mail:senabalina26@gmail.com
- Alternative: sena.belina@ju.edu.et

Education

- MSc in Maternity Nursing, Jimma University in 2012
- BSc in Nursing, Haramaya University, Ethiopia in 2006
- High school Najo S/S/ School
- Grade 7 and 8 Najo Let .Col. Abdissa Aga
- Grade 1 to 6 Burka Chochi

Short term trainings		
No	**Type of the training**	**The provided organisation**
1.	Implanon Insertion & Removal -TOT	FMoH - N.V Organon of The Netherland
2.	Clinical and Effective Teaching Skill	Jhpiego - FMoH and MoE
3.	Integrated management of newborn & childhood illness (IMNCI)	FMoH, Jimma university and WHO
4.	Basic Emergency Obstetric and Newborn care basic (BEmONC)	EMwA - FMoH and UNFPA
5.	Nutritional technical update course	Jhpiego – Ethiopia
6.	JBI Systematic review	Jimma university malarial center
7.	PMTCT of HIV/AIDS Option B^+	EMwA - Jhpiego and FMoH
8.	Basic Emergency Obstetric and Newborn care (BEmONC) -TOT	EMwA - KOFIH–JU-JZHO MNCH Project
9.	Comprehensive family planning -TOT	EMwA - KOFIH–JU-JZHO MNCH Project
10.	Compressive Abortion Care -TOT	EMwA - KOFIH–JU-JZHO MNCH Project
11.	Qualitative Research Methods and Analysis with MAXQDA	LMU and Jimma university

12.	Evidence for Policy	JU - Alliance for health policy WHO
13.	Health Research Ethics	Jimma university
14.	Evidence Based Clinical Fellowship Training	JU –EBHC center and JBI
15.	HDP	Jimma university
16.	Comprehensive Systematic Review	JU- EBHC center and JBI
17.	Evidence-based practice online course	JU-PXL University collaborative project
18.	Train the Trainer - Evidence Implementation Training Program	JBI EITP Adelaide, Australia
19.	Evidence to Policy (E2P) Training	JU ,Health Policy and Management Department and Fenot/Harvard

Personal skills and competences

Language

- Afan Oromo
- Amharic
- English

Computer skills and competences	• Microsoft word and Microsoft Power Point, Moderate skill on Microsoft excel and Microsoft publishers • EPI- info/EPI_DATA Manager • SPSS statistical data analysis, Open code, and ATLAS-ti; basic skill on STATA, R-software, JBI systematic review software and Qualitative MAXQDA software • ODK

Peer Reviewed Publications

1. **Kitila SB**, Gmariam A, Molla A, Nemera G (2014) Utilization of Partograph during Labour and Birth Outcomes at Jimma University. J Pregnancy and Child Health 1:101. doi: 10.4172/2376-127X.1000101
2. **Sena B**, Bosena T. Predictors of Birth Preparedness and Complication Readiness among Pregnant Women in Jimma Town, Southwest Ethiopia, a Cross Sectional Study, http://dx.doi.org/10.13070/rs.en.1.595
3. Yegezu RT, **Kitila SB** (2014) Assessment of Factors Affecting Choice of Delivery Place among Pregnant Women in Jimma Zone, Southwest Ethiopia: Cross Sectional Study. J Women's Health Care 4: 211. doi:10.4172/2167-0420.1000211

4. Tsegaye G, Kifle W, **Sena B**. Client's Satisfaction with Family Planning Services and Associated Factors among Family Planning Users in Hossana Town Public Health Facilities, South Ethiopia: Facility-based cross-sectional study. Int.J. Nurs.Midifer. Vol.7 (5), 74-83, May 2015. DOI: 10.5897/IJNM2015. 0163 https://academicjournals.org/journal/IJNM/article-full-text-pdf/8C48F9852248
5. Dinaol B, Getnet F, Eyasu Z, **Sena B**. Bovine hydatidosis: Prevalence, public health, and its economic significance in and around Harar, Ethiopia. Vol. 6(7) JVMAH, DOI: 10.5897/JVMAH2014.0337
6. **Kitila SB**, Asaye AM, Issa AY (2015) Assessment of Sexual Activity and Contraceptive use among Young Ages of Jimma Teachers Training College Students, Jimma Town, Southwest Ethiopia. Cross Sectional Study. Primary Health Care 5: 188. doi:10.4172/2167-1079.1000188
7. Bezani MS, Haile M, **Kitila SB** (2015) Challenges to use Volunteer Counseling and Testing for HIV/AIDS among Jimma University, College of Public Health and Medical Sciences Graduating Class Students Jimma, Southwest Ethiopia, Cross Sectional Study. J Nurs Care 4: 259. doi:10.4172/2167-1168.1000259
8. Tesfaye T, Abera A, Balcha F, Nemera G, **Belina S** (2015) Assessment of Factors Affecting Performance of Nurses Working at Jimma University Specialized Hospital in Jimma Town, Oromia Region, South-West Ethiopia. J Nurs Care 4: 312. doi: 10.4172/2167-1168.1000312
9. **Sena B,** Fekadu Y. (2016). Client Satisfaction with Abortion Service and Associated Factors among Clients Visiting Health Facilities in Jimma Town, Jimma, Southwest, Ethiopia. Quality in Primary Care (2016) 24 (2): 67-76
10. **Kitila SB**, Molla W, Wedaynewu T, Yadessa T, Gellan M (2018) Folk Practice During Childbirth and Reasons for the Practice in Ethiopia: A Systematic Review. Gynecol Obstet 8: 465. doi:10.4172/2161-0932.1000465
11. Tesfaye A G, Tefera B L, **Sena B K**. Pregnancy Induced Hypertension and Associated Factors among Pregnant Women Receiving Antenatal Care Service at Jimma Town Public Health Facilities, Southwest Ethiopia. J Gynecol Women's Health. 2018: 10(3): 555792. DOI: 10.19080/JGWH.2018.10.555792

12. **Belina S,** Negro B, Getachew M, Alemu T, Girma E (2018) Is the Unavailability of Partograph a Reason for its Low Usage? The Case of Jimma University Medical Center. Health Care Current Reviews 6: 225. doi: 10.4172/2375-4273.1000225
13. Demisse TL, Aliyu SA, **Kitila SB,** Tafesse TT, Gelaw KA, Zerihun MS. Utilization of preconception care and associated factors among reproductive age group women in Debre Birhan town, North. Reproductive Health (2019) 16:96 https://doi.org/10.1186/s12978-019-0758-x
14. Bekele G, Terefe G, Sinaga M, **Belina S**. Utilization of non-pneumatic anti-shock garment and associated factors for postpartum hemorrhage management among health care professionals in public hospitals of Jimma zone, south-West. Reproductive Health (2020) 17:37 https://doi.org/10.1186/s12978-020-0891-6
15. **S B Kitila et al.** Compliance to immediate newborn care practice among midwives working in maternity wards, International Journal of Evidence-Based Healthcare: 18(3):337-344, September 2020. doi: 10.1097/XEB.0000000000000237 https://journals.lww.com/ijebh/Abstract/2020/09000/Compliance_to_immediate_newborn_care_practice.8.aspx
16. Kebede AO, Biratu YT, Kebede AO, **Belina SK.** (2020). Institutional Delivery among Young Women in Ethiopia: Further Analysis of Trends and Determinants, from the Four Consecutive Ethiopia Demographic and Health Survey. International Journal of Women's Health. 2020:12 1047–1056. https://doi.org/10.2147/IJWH.S275153
17. **Kitila S.B**., Terfa, Y.B., Akuma, A.O. et al. Spousal age difference and its effect on contraceptive use among sexually active couples in Ethiopia: evidence from the 2016 Ethiopia demographic and health survey. Contracept Reprod Med 5, 34 (2020). https://doi.org/10.1186/s40834-020-00135-4
18. Tigist Teklu, **Sena Belina**, Fantaye Chemir, Martha Tessema, Worke Yismaw: Unintended Pregnancy and Associated Factors among HIV Positive Women in Ilu Aba Bora zone, Southwestern Ethiopia: A Facility-Based Cross-Sectional Study. HIV/AIDS - Research and Palliative Care. 2021:13 197–203.

https://doi.org/10.2147/HIV.S288373

19. Kebede A, Kebede A, **Belina S**, Biratu Y. Trends and Determinants of Small Birth Weight in Ethiopia: Further analysis of Ethiopian Demographic and Health Surveys. Ethiop J Health Sci. 2021; 31 (2):299. Doi: http://dx.doi.org/10.4314/ejhs.v31i2.13 https://ethjhealths.org/
20. Olika, A.K., **Kitila, S.B.,** Terfa, Y.B. et al. Contraceptive use among sexually active female adolescents in Ethiopia: trends and determinants from national demographic and health surveys. Reprod Health 18, 104 (2021). https://doi.org/10.1186/s12978-021-01161-4
21. Mengistu GT, **Kitila, S.B**, Deme, M.B. Partners' Knowledge of Obstetric Danger Signs, and Level of Birth Preparedness and Complication Readiness and Associated Factors in Wara Jarso, North Shewa, Oromia, Ethiopia, 2019. J Med Physiol Biophys. 2021; 69:27–38. DOI: 10.7176/JMPB/69-05
22. Mesganew Amare, Adugna Olani, Habtamu Hassen, Habtamu Hassen, Bikila Jiregna, Nigusu Getachew, **Sena Belina**. Perinatal Outcomes and Associated Factors among women with hypertensive Disorders of Pregnancy Delivered in Jimma Zone Hospitals, Southwest, Ethiopia. Ethiop J Health Sci. 2021; 31(6):1145. doi: http://dx.doi.org/10.4314/ejhs.v31i6.9
23. **Kitila** et al. Average Time Spent in Referral Process and its Determinants Among Clients of Maternal and Child Health Service in 2 Districts of Jimma Zone, Ethiopia. 2022. Journal of Patient Experience 9: 1-7. DOI: https://doi.org/10.1177/23743735221086757
24. **Kitila** SB, Feyissa GT, Olika AK, Wordofa MA. Maternal Healthcare in Low- and Middle-Income Count. Health Services Insights: A Scoping Review 15; 1–7. 2022. https://doi.org/10.1177/1178632922110031
25. Jebena MG, Tesfaye M, Abashula G, **Balina S**, Jackson R, Assefa Y, et al. Barriers and facilitators of maternal health care services use among pastoralist women in Ethiopia: Systems thinking perspective. Pastoralism. 2022;12(1). https://doi.org/10.1186/s13570-022-00236-6
26. Wodaynew T, Agenagnew L, **Balina S.** Improving nursing tutors practical area

assessment knowledge through action research. Int J Africa Nurs Sci [Internet]. 2019;18(December 2022):100524.
https://doi.org/10.1016/j.ijans.2022.100524

27. **Kitila, S.B**., Feyissa, G.T. & Wordofa, M.A. Why do women walk away from maternal health services in Southwest Ethiopia? A qualitative study of caregivers' and clients' perspectives. BMC Women's Health 23, 83 (2023). https://doi.org/10.1186/s12905-023-02207-4
28. **Kitila SB,** Feyissa GT, Wordofa MA. Completion of the Maternal Health Care Continuum-Barriers and Facilitators among Pregnant Women in Jimma Zone, Southwest Ethiopia: A Prospective Study. Health Serv Insights. 2023 Nov 30; 16:11786329231214607. https://doi.org/10.1177/11786329231214607
29. Negesa B, Hirbaye M, Kebede A, **Belina S**. Factors influencing meconium-stained amniotic fluid in West Guji , Oromia , Ethiopia : A cross-sectional study. Clin Epidemiol Glob Heal [Internet]. Elsevier B.V.; 2024;29(December 2023):101669. Available from: https://doi.org/10.1016/j.cegh.2024.101669

Project research Experience /Research grants

① Won 12 research grants as PI and co-PI. For instance,

1. Birth preparedness and complication readiness
2. Satisfaction with Abortions Service among Adolescent
3. Systems thinking approaches for RMNH among pastoralists community
4. Factors Affecting nurses performance
5. Parental competence on the care of their babies among mothers with newborn Admitted to Neonatal Intensive Care Unit
6. Effect of an Organized Clinical Mentoring on Missed Nursing Care
7. Compliance to immediate newborn care practice
8. Average time spent between referring and service utilization by women
9. Nursing Education Quality & its Challenges in Ethiopian higher Public Universities
10. Socio-economic Vulnerability and Coping strategies of Migrant Returnees
11. Effect of covid-19 outbreak on RH services
12. Referral Communication System in Jimma Zone
13. Menstrual wellbeing: patterns, its effect on HRQL and academic performance

14. Analysis of coverage and Utilization of Radio Message in Jimma Zone

Consultancy services and Training

Provided different training and consultancy services at different times with different organizations in areas such as;

1. BEmONC
2. Comprehensive Family Planning (CFP)
3. Basic national comprehensive PMTCT
4. Comprehensive Abortion care (CAC)
5. Data management Training (DMT) for Health care providers
6. Integrated Refreshment Training (IRT)
7. Women's Forum Advocacy for Health care providers
8. Integrated Maternal and new-born care (IMNCH)
9. KOFIH-JU-JZHO MNCH Project endline survey
10. Mamber of EITP Evidence Based Health Care Center
11. Social accountability , Advocacy , Life skills ,Communication and SRHR Training
12. Project Officer at Yonsei Global Health Center Ethiopia Office (YGHC ETH) February 2022 to January 2023

Participation as field researcher, supervisor, and facilitator in qualitative research

1. Awareness and Perception of Community Based Education programs, 2012
2. JU- KOFIH- Jimma Zone Collaborative Project on maternal health service utilization
3. Integration of Human and Animal Health System in selected Countries in East Africa
4. Participatory Ethnographic Evaluation and Research (PEER) Approach financed by DFID, UK
5. Systems thinking approaches for RMNH among pastoralists
6. Quality of Maternal health service, funded by KOICA
7. Innovating for Maternal and Child Health in Africa (IMCHA) project
8. Lived Experience, Care-seeking path, Quality of Life, and Intention to Prevent Obstetric Fistula Recurrence among Obstetric Fistula Cases

9. National Campaign for Promoting Knowledge, Attitude, and Behavioral Change in Population and Reproductive Health in Ethiopia (SHaPE Phase 2) for Target Groups in Two Cities and Five Regions

Participation in University Affairs

1. Served as;
    ① School of Nursing and Midwifery research coordinator
    ① Neonatology program coordinator
    ① Various committee members at department level
    ① IRB Institute of Health secretary
    ① IRB Institute of Health committee member
    ① PMU -KOFIH–JU-JZHO MNCH collaborative Project
2. Active participation in CBE (as supervisor, team leader)
3. Ethiopian-Evidence Based Health Core member
4. Member of AEU Fatima College of Health Sciences (FHSC) Nursing curriculum development team
5. Member of the JU PhD in Nursing curriculum development team
6. Member of JU-HI IRB written guidance for ethical review development team
7. Leader of the JU School of Nursing program coordinators SOP development team

Guest lecturer

① Sarved as a guest lecturer at different times.

Mentoring graduate students, served as an external examiner and others

① Served as a mentor for 24 graduate students and successfully graduated, and examined 37 MSc theses at different universities.
① Critical reviewer of Debre Berhane University Maternity and RH curriculum
① Critical reviewer of Wolkite University Maternity and RH curriculum
① Critical reviewer of Bule Hora University Maternity and RH curriculum

Volunteer activities and Awards

① Active Voluntary member of Family Guidance Association of Ethiopia (FGAE), and Champion of the Year for outstanding contribution for the expansion of SRH, 2016.

① Jimma University Health institute foot baal Mass sport team member

① Member of Red Cross Ethiopian

① Member of Ethiopian Public Health Association (EPHA)

① Member of Ethiopian Nurse Association (ENA)

① Member of Ethiopian Midwives Association (EMwA)

Declaration

I, the undersigned, 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 thesis, have been fully acknowledged.

Candidate: **Sena Belina Kitila** (MSc)

Signature: _____

Date: -------/------/2023

Date of submission _____

This thesis has been submitted for examination with my approval as candidate's promoter/s.

Major Supervisor: **Muluemebet Abera** (PhD, Associate Prof.)

Faculty of Public Health, Institute of Health

Jimma University

Signature: _____

Date: -------/------/2023

Co- Supervisor: **Garumma Tolu** (PhD, Assistant Prof.)

Department of Health and Nutrition Science

The City University of New York, USA

Signature: _____

Date: -------/------/2023