SCHOOL OF GRADUATE STUDIES

UTILIZATION AND DETERMINANTS OF PRECONCEPTION CARE AMONG PREGNANT WOMEN ATTENDING ANTENATAL CARE IN WOLKITE TOWN, CENTRAL ETHIOPIA, 2026.

BY:

DR. ADDIS GEBRU

(MD, OB/GYN RESIDENT)

FEBRUARY, 2026

WOLKITE, ETHIOPIA

Wolkite university

College of Medicine and Health Sciences

School of Medicine

Department of Obstetrics and Gynecology

Utilization and determinants of Preconception care among pregnant women attending Antenatal care in Wolkite town, Central Ethiopia, 2026.

BY: Dr. Addis Gebru (MD, Obstetrics and Gynecology Resident)

Email: ekshesh2000@gmail.com

Phone: +251924693689

Major advisor:

1. **Dr. Shimelis Gizaw (MD, Assistant professor of Obstetrics and Gynecology)**
   Phone: +251 912023368

Co-advisor:

2. **Abebaw Wasie (MPH, Assistant professor of Reproductive Health)**
   Phone: +251910686501

February, 2026

Wolkite, Ethiopia

APPROVAL SHEET

Submitted by:

Dr. Addis Gebru (PI)	MD, ObGyn Candidate	 Signature	27/2/2026 Date

Approved by:

Dr. Shimelis Gizaw (Major Advisor)	MD, Assistant Professor, Obstetrics & Gynecology	 Signature	27/2/2026 Date
Abebaw Wasie (Co-Advisor)	MPH, Assistant Professor, Reproductive Health,	 Signature	27/2/2026 Date
Dr. Agize Asfaw (Examiner)	PHD, Associated professor, Human nutrition	 Signature	27/2/2026 Date
Dr. Zelele Daniel (Examiner)	MD, Assistant Professor, Obstetrics & Gynecology	 Signature	27/2/2026 Date

Head, Department

Dr. Shimelis Gizaw	MD, Assistant Professor, Obstetrics & Gynecology	 Signature	27/2/2026 Date

College/Institute Dean

		Signature	27/2/2026 Date

Director, School of Graduate studies

		Signature	27/2/2026 Date

CERTIFICATION SHEET

We hereby certify that we have read and evaluated this Thesis titled "Utilization and determinants of Preconception care among pregnant women attending Antenatal care in Wolkite town, 2026, Multi-center institutional based cross-sectional study" prepared under our guidance prepared by Dr. Addis Gebru. We recommend the Thesis shall be submitted as fulfilling the requirements for the award of certificate of Specialty in Obstetrics and Gynecology.

Advisors:

Dr. Shimelis Gizaw (Major Advisor)	MD, Assistant Professor, Obstetrics & Gynecology	 Signature	27/2/2026 Date
Abebaw Wasie (Co-Advisor)	MPH, Assistant Professor, Reproductive Health,	 Signature	27/2/2026 Date

As members of the Board of Examiners of the Certificate of Specialty in Obstetrics and Gynecology, Thesis open defense examination, we have read and evaluated this thesis prepared by Dr. Addis Gebru, and examined the candidate. We hereby certify that; the thesis is accepted for fulfilling the requirements for the award of the Certificate of Specialty in Obstetrics and Gynecology.

Examiners

Dr. Agize Asfaw (Examiner)	PHD, Associated professor, Human nutrition	 Signature	27/2/2026 Date
Dr. Zelele Daniel (Examiner)	MD, Assistant Professor, Obstetrics & Gynecology	 Signature	27/2/2026 Date

Chairperson

DECLARATION

By my signature below, I declare and affirm that this specialty thesis entitled *"**Utilization and determinants of Preconception care among pregnant women attending Antenatal care in Wolkite town, Central Ethiopia, 2026"*** is my original work in partial fulfillment for the requirement in **certificate of specialty in Obstetrics and Gynecology program** and not submitted for any other educational program fulfillments or publications. All sources used here for review of the proposal and the thesis are duly acknowledged.

Name of Investigator:

Dr. Addis Gebru (PI)	MD, ObGyn Candidate	 Signature	27/2/2026 Date

Advisors:

Dr. Shimelis Gizaw (Major Advisor)	MD, Assistant Professor, Obstetrics & Gynecology	 Signature	27/2/2026 Date
Abebaw Wasie (Co-Advisor)	MPH, Assistant Professor, Reproductive Health,	 Signature	27/2/2026 Date

ACKNOWLEDGEMENT

First and foremost I would like to thank Almighty God. I would like to express my heartfelt gratitude to my advisors, Dr. Shimelis Gizaw and Mr. Abebaw Wasie, for their guidance, encouragement, and invaluable support throughout this research. Your advice and constructive feedback have been essential to the completion of this thesis.

I am sincerely thankful to the study participants and the staff of health facilities in Wolkite town for their cooperation and generosity in sharing their time and experiences. Without them, this study would not have been possible.

Finally, I am deeply grateful to my family and friends for their patience, encouragement, and unwavering support throughout my academic journey.

ABBREVIATIONS

ANC	Antenatal care
AOR	Adjusted Odds Ratio
CI	Confidence Intervals
COR	Crude Odds Ratio
EBHC	Edget-Ber Health center
GHC	Gubrye Health center
PCC	Preconception care
PPS	Population proportion sampling
SDG	Sustainable Development Goal
SPSS	Statistical package for social science
SRS	Systematic random sampling
WHC	Wolkite Health center
WHO	World health organization
WUCSTH	Wolkite University comprehensive specialized teaching hospital

TABLE OF CONTENTS

APPROVAL SHEET ii
CERTIFICATION SHEET iii
DECLARATION iv
ACKNOWLEDGEMENT v
ABBREVIATIONS vi
TABLE OF CONTENTS vii
LIST OF TABLES ix
LIST OF FIGURES x
ABSTRACT xi
CHAPTER 1: INTRODUCTION 1
1.1. Background 1
1.2. Statement of the Problem 2
1.3. Objectives 4
1.4. Research questions 5
1.5. Significance of the Study 6
1.6. Scope of the study 7
1.7. Operational definitions 8
CHAPTER 2: LITERATURE REVIEW 9
2.1 Preconception Care Utilization 9
2.2 Determinants of Preconception Care Utilization 9
CHAPTER 3: METHODS AND MATERIALS 13
3.1. Study Area 13
3.2. Study Period 13
3.3. Study Design 14
3.4. Source Population 14
3.5. Study Population 14
3.5.1 Inclusion Criteria: 14
3.5.1. Exclusion Criteria: 14
3.6. Sample Size Determination 14
3.7. Sampling Procedure 16
3.8. Study Variables 18

3.8.1. Dependent Variable: 18
3.8.2. Independent Variables: 18
3.9. Data Collection Tools and Procedures 18
3.10. Data Processing and Analysis 18
3.11. Data Quality Control 19
3.12. Ethical Considerations 19
3.13. Dissemination of Findings 19
CHAPTER 4: RESULT 20
CHAPTER 5: DISCUSSION 31
Limitations of the Study 38
Strengths of the Study 39
CHAPTER 6: CONCLUSION AND RECOMMENDATIONS 40
Conclusion 40
Recommendations 41
CHAPTER 7: REFERENCES I
CHAPTER 8: APPENDIX V
Annex. Data collection tool V

LIST OF TABLES

Table 1: Calculated sample sizes for determinants and adjusted for 10% non-response 15

Table 2: Distribution of study subjects by socio-demographic characteristics..... 20

Table 3 Distribution of study subjects by Knowledge of respondents 23

Table 4: Health care related factors of preconception care..... 26

Table 5: Bivariable analysis..... 27

Table 6: Multivariable analysis of determinants..... 29

LIST OF FIGURES

Figure 1: Conceptual Framework 3

Figure 2: Schematic representation of sampling procedure. 17

Figure 3: Utilization of preconception 24

Figure 4: Type of preconception care taken 24

Figure 5: Reason for not using preconception care 25

ABSTRACT

Background: Preconception care (PCC) improves maternal and neonatal outcomes by addressing health risks before pregnancy, yet utilization remains low in Ethiopia. This study assessed PCC utilization and determinant factors among pregnant women in Wolkite town.

Methods: A multi-centered institution-based cross-sectional study was conducted among 728 pregnant women attending antenatal care from December 2025 to January 2026. Multi-staged Systematic Random sampling and interviewer-administered questionnaires were used. Data were analyzed with SPSS using bivariable and multivariable logistic regression. Statistical significance was set at $p < 0.05$ (AOR, 95% CI).

Results: Magnitude of PCC utilization was 21.4% (95% CI: 17.5%–25.3%). Advanced maternal age ≥35 years (AOR = 2.78; 95% CI: 1.75–4.42), Higher education (AOR = 2.74; 95% CI: 1.85–4.05), Employed women (AOR = 1.97; 95% CI: 1.33–2.92), Higher income (≥20,000 ETB/month) (AOR = 6.38; 95% CI: 3.12–13.04; P < 0.001), Good Knowledge (AOR = 16.5; 95% CI: 9.2–29.6), Preexisting medical conditions (AOR = 12.8; 95% CI: 6.7–24.5), Contraceptive use (AOR = 13.2; 95% CI: 8.1–21.6), Husband support, and Residence within 30 minutes of a health facility were independent predictors of PCC utilization.

Conclusion: PCC uptake in Wolkite town is low due to limited awareness and access barriers. Enhancing community education, integrating PCC into routine reproductive services, strengthening facility readiness, and promoting male partner involvement are essential to improve maternal and neonatal health.

Keywords: Preconception care, utilization, determinants, Ethiopia

CHAPTER 1: INTRODUCTION

1.1. Background

Preconception care (PCC) encompasses a range of health interventions provided to women and couples before conception, aimed at identifying and modifying biomedical, behavioral, and social risk factors that may adversely affect maternal and child health outcomes. These interventions include health promotion, risk assessment, counseling, and tailored strategies to meet individual needs (1). Globally, PCC is recognized as a key strategy for reducing maternal and neonatal morbidity and mortality (2). Evidence indicates that pre-pregnancy interventions such as folic acid supplementation, chronic disease management, and lifestyle modification can reduce the risk of congenital anomalies, maternal complications, and poor birth outcomes (3,4).

Despite these benefits, PCC utilization remains suboptimal in many low- and middle-income countries, particularly in sub-Saharan Africa, where health systems prioritize antenatal rather than pre-pregnancy care (5). In Ethiopia, maternal health continues to be a public health priority. While access to antenatal, intrapartum, and postnatal care has improved, PCC services remain underutilized, and awareness of their importance is low (6). Studies in northern Ethiopia report that only 14% of women utilize any form of PCC, with factors such as education, residence, and previous adverse outcomes significantly influencing uptake (6).

Wolkite town represents a socio-economically diverse population. However, limited evidence exists regarding the level of PCC utilization and its determinants in this context. Understanding these factors is crucial to design targeted interventions and improve maternal and neonatal health outcomes through increased uptake of preconception services.

1.2. Statement of the Problem

Maternal and child health outcomes remain a major public health concern in low- and middle-income countries, including Ethiopia. One critical but often overlooked component in improving maternal and neonatal health is PCC (6). Despite global and national commitments to reduce maternal and neonatal morbidity and mortality, the utilization of PCC remains significantly low, especially in rural and semi-urban areas of Ethiopia.

Evidence shows that women who receive PCC have better pregnancy outcomes, as this care facilitates early detection and treatment of conditions like diabetes, hypertension, and sexually transmitted infections, which may adversely affect pregnancy (4,7). Additionally, PCC offers an opportunity to provide health education on family planning, nutrition, lifestyle modifications, and folic acid supplementation to reduce the risk of congenital anomalies (3,4). However, the practice of delivering or seeking PCC services is not yet well integrated into the healthcare system in many parts of Ethiopia, including Wolkite town, the capital of Gurage Zone.

Limited awareness, socio-cultural barriers, poor accessibility of services, low health-seeking behavior, and lack of trained healthcare providers have been identified as key deterrents to PCC utilization in similar settings (8,9). Moreover, while antenatal care services are relatively more utilized, there is a substantial gap in the continuum of care from the preconception to the prenatal period. As a result, a significant proportion of pregnancies are unplanned or poorly timed, further increasing the risks to maternal and neonatal health.

Despite the recognized benefits of PCC, there is a dearth of empirical data on its utilization and associated factors among pregnant women in Wolkite town. Understanding the level of utilization and determinants is essential to inform targeted interventions and policy decisions. Therefore, this study aims to assess the utilization of preconceptional care and identify its determinants among pregnant women attending ANC at Wolkite town.

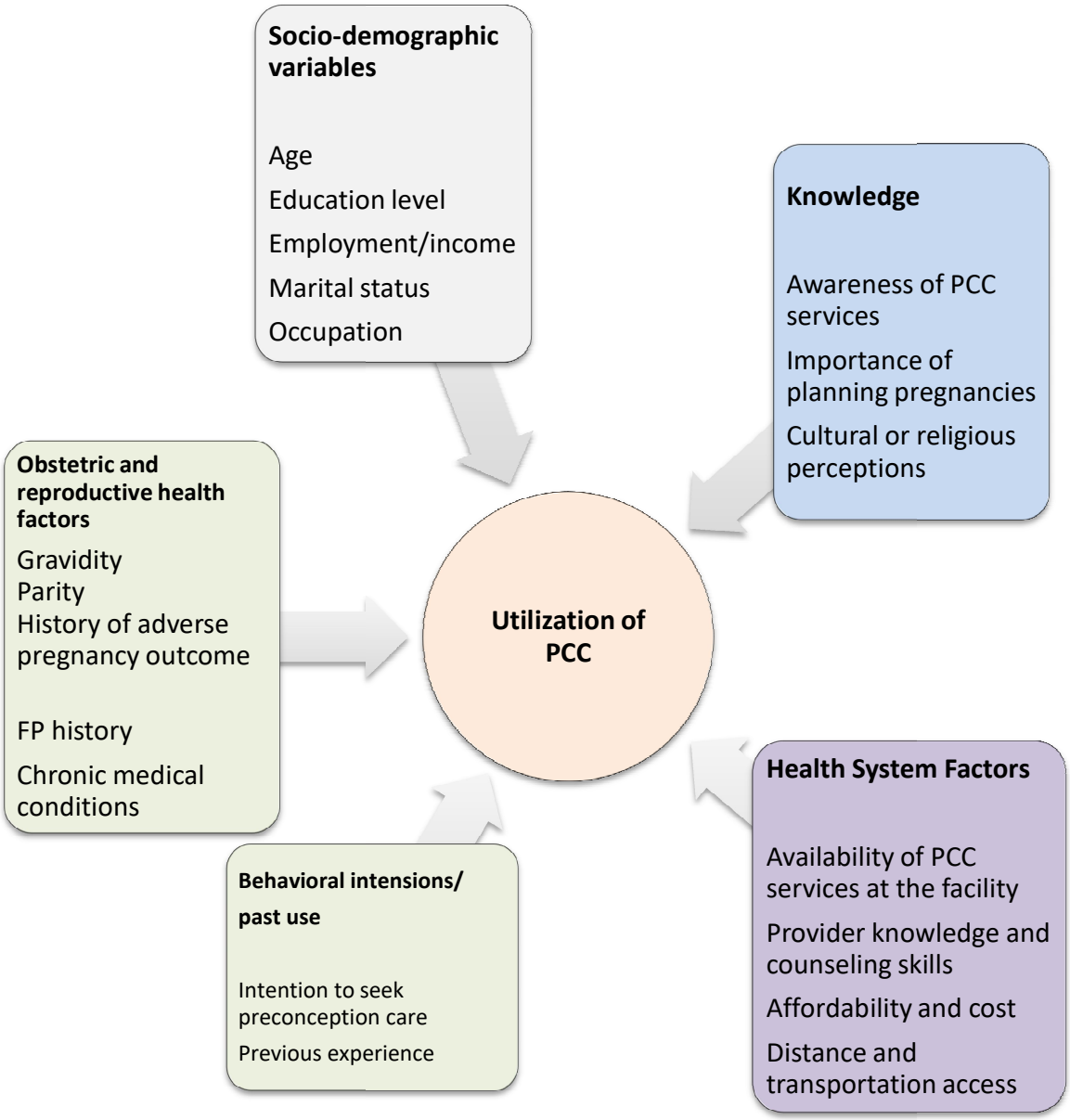


Figure 1: Conceptual Framework

1.3. Objectives

General objective

To assess Utilization and determinants of Preconception care among Pregnant women attending Antenatal care in Wolkite town, Central Ethiopia from December 1, 2025 to January 31, 2026.

Specific objectives

To determine the level of Utilization of Preconception care among Pregnant women attending Antenatal care in Wolkite town, Central Ethiopia from December 1, 2025 to January 31, 2026.

To identify determinants of Preconception care among Pregnant women attending Antenatal care in Wolkite town, Central Ethiopia from December 1, 2025 to January 31, 2026.

1.4. Research questions

What is the level of Preconception care utilization among pregnant women Attending ANC in Wolkite town, Central Ethiopia?

Which factors influence preconception cares services among pregnant women Attending ANC in Wolkite town, Central Ethiopia?

1.5. Significance of the Study

Despite its recognized importance globally, the utilization of PCC remains low in many developing countries, including Ethiopia. Understanding the level of utilization and the factors influencing preconception care among women in Wolkite town is essential for several reasons.

Firstly, improving maternal and child health outcomes is a primary concern. Evidence indicates that PCC can reduce the risk of maternal and neonatal complications, such as preterm birth, low birth weight, congenital anomalies, and maternal morbidity. By identifying utilization patterns and barriers in Wolkite town, this study can inform interventions aimed at enhancing maternal and child health outcomes.

Secondly, the study can guide health policy and program development. Data generated from this research will provide local health authorities and policymakers with evidence-based insights to strengthen preconception care programs. It may highlight gaps in service delivery, accessibility, and awareness, enabling the design of targeted strategies to improve uptake.

Thirdly, identifying determinants of utilization is crucial. By exploring sociodemographic, knowledge-based, and healthcare system-related factors influencing the use of PCC, the study can inform context-specific interventions to address these determinants effectively.

Fourthly, the study will support community awareness and health education. Findings can be used to develop community education programs that raise awareness about the importance of preconception care and its role in ensuring healthy pregnancies, potentially leading to increased service utilization.

Additionally, this research contributes to academic knowledge. Local data on preconception care in Wolkite town and the broader Gurage Zone are currently limited. This study will provide evidence that is valuable for future research, policy formulation, and integration of PCC into routine maternal health services.

Finally, the study aligns with national and global efforts to reduce maternal and neonatal mortality. Ethiopia continues to face high maternal and neonatal mortality rates, and optimizing PCC is a key strategy in achieving the Sustainable Development Goal (SDG) 3, which aims to ensure healthy lives for all and reduce maternal mortality.

1.6. Scope of the study

This study focused on assessing the utilization and determinants of PCC among pregnant women attending ANC services in public and private health facilities of Wolkite town, Central Ethiopia, in 2026.

Geographical scope: The study was limited to health facilities located in Wolkite town, and findings primarily represent women accessing ANC services within this town.

Population scope: The study included pregnant women attending ANC clinics during the data collection period. Women who were not attending ANC or who live outside the study area are not included.

Content scope: The study assessed: Level of preconception care utilization, Components of PCC services received before the current pregnancy, Socio-demographic factors, Reproductive and obstetric characteristics, Health service–related factors, Knowledge and awareness of PCC, Partner and family support factors associated with PCC utilization.

Time scope: Data collection was conducted during a specified period in 2026, and the study examines PCC utilization prior to the current pregnancy.

Methodological scope: The study employs an institution-based cross-sectional study design, collecting data using structured questionnaires and medical record reviews where applicable.

1.7. Operational definitions

- **Preconception Care (PCC):** is a comprehensive set of interventions that should be given to reproductive-age women before pregnancy to promote a healthy pregnancy and its outcome.
- **Utilization of Preconception Care:** Women was considered to have used PCC if they received at least one of the following components of preconception care before pregnancy: counseling, disease screening and treatment, folic acid, vaccines, changing their diet, cessation of alcohol drinking, cessation of smoking, or creating a healthy environment (advice, treatment, and lifestyle modification).
- **Knowledge of Preconception Care:** Awareness and understanding of preconceptional health services and their benefits.
- **Good knowledge:** Women who scored ≥ mean (or ≥50%) using knowledge assessment tool.
- **Poor knowledge:** Women who scored < mean (or <50%) using knowledge assessment tool.
- **Determinants of PCC Utilization:** Factors that influence whether a woman uses preconception care.

CHAPTER 2: LITERATURE REVIEW

2.1 Preconception Care Utilization

PCC is globally recognized as a cost-effective strategy to prevent maternal and neonatal complications, including low birth weight, congenital anomalies, and preterm birth. Nevertheless, its utilization remains low worldwide. According to the World Health Organization, fewer than 40% of women in many countries receive any form of PCC, with low- and middle-income countries disproportionately affected due to higher prevalence of risk factors such as malnutrition and limited healthcare access (3,5). PCC remains underutilized, particularly in LMICs, due to health system limitations, low awareness, socio-cultural barriers, and inequities in access (10,11).

A study in London (2018, n=1,173) reported that 27% of women consulted a health professional before pregnancy, while 51% of all women and 63% of those with a planned pregnancy took folic acid supplementation. Women receiving preconception advice were 2.34 times more likely to adopt healthier behaviors and 2.18 times more likely to follow a healthier diet before pregnancy (12).

Similarly, in São Paulo, Brazil (2020), only 17% of pregnant women reported receiving any PCC (13). In contrast, a government-led initiative in China (2019), the National Free Preconception Health Examination Project, increased PCC coverage to over 60% (4). Studies in Sri Lanka (2018) and Addis Ababa, Ethiopia (2015) reported PCC utilization rates of 27.2% and 40%, respectively (5,14). More recent Ethiopian studies in West Guji Zone (2023), Mizan-Aman (2022), and Hosanna town (2022) reported PCC uptake ranging from 15.8% to 28.6% (7,8,9).

2.2 Determinants of Preconception Care Utilization

Determinants of PCC utilization are multi-dimensional, including socio-demographic, reproductive, behavioral, and health system factors. Modifiable behavioral factors such as nutrition, physical activity, alcohol and substance use, and management of chronic conditions influence uptake (11). Broader social determinants, including education, gender-based violence, and contraceptive access, also play a critical role (12).

A community-based cross-sectional study done in Sidama, Ethiopia, found that women aged ≥35 had 2.5 times higher odds of PCC utilization compared with younger women (48% vs 32%; AOR ≈2.5, p<0.05) (15). Age and educational status significantly affect PCC utilization. Women younger than 20 or aged 20–24 and those lacking formal education were less likely to seek PCC, whereas primigravid women and those with ≥16 years of education were more likely to report preconception visits (16,17). Similar associations were observed in international studies for folic acid or vitamin supplementation, smoking cessation, and alcohol reduction behaviors, which were influenced by age, employment, education, previous pregnancy loss, and planned pregnancy status (18-21).

An Ethiopian study done in 2025 reported that women with secondary or higher education were approximately twice as likely to use PCC compared with women with no formal schooling (46% versus 22%; pooled OR ≈2.1, p < 0.001) (6). Recent evidence from an urban Ethiopian cohort study demonstrated that women in the highest wealth quintile were 3.2 times more likely to use PCC than those in the lowest quintile (55% versus 23%; AOR ≈3.2; p<0.01) (22).

A recent Ethiopian facility-based study at West Shewa zone found that women engaged in family planning services demonstrated a two- to threefold higher likelihood of preconception utilization compared with non-users (58% versus 26%; AOR ≈2.8; p < 0.001) (9). Knowledge of maternal healthcare strongly predicts PCC uptake. Women with greater awareness of maternal health services were more likely to utilize PCC (20). Socio-economic status, including household income and health insurance, also positively influences utilization, with wealthier women accessing services more frequently (22).

Knowledge of preconception health and PCC services is a key determinant. Women with adequate awareness of interventions such as folic acid supplementation, disease screening, and lifestyle modification are more likely to utilize PCC (6).

A systematic review of reproductive health in East Africa found that male involvement increased maternal service uptake by approximately 30–50% (23). The systematic review and meta-analysis by Ditekemena and colleagues (2024), synthesizing evidence from East African countries, found that male partner involvement significantly improves reproductive and maternal

health outcomes, including increased uptake of PCC, ANC, skilled facility delivery, postpartum care, family planning use, and HIV testing among couples by 30–50% (23,24). The study showed that when men actively participate in decision-making, provide emotional and financial support, and attend health services with their partners, women are more likely to access and continue reproductive health services (24).

Health system factors, including service availability and accessibility, are crucial determinants of PCC utilization. In southern Ethiopia, although 78% of mothers had access to health facilities within 30 minutes, only 34% reported availability of PCC guidelines or essential medications (25). This limited service provision contributes to low PCC uptake in the region.

Rural women often experience lower utilization due to inadequate healthcare infrastructure. For example, studies show that women living in rural areas were 2.1 times less likely to use PCC compared with urban residents (AOR = 0.48; 95% CI: 0.30–0.76) (26). In addition, male partner support significantly enhances PCC uptake. Women who reported active partner involvement were 3.2 times more likely to utilize preconception services (AOR = 3.2; 95% CI: 2.1–4.9) (22,27).

Socioeconomic status also influences utilization. Women in the highest wealth quintile were 3.2 times more likely to use PCC than those in the lowest quintile (55% versus 23%; AOR = 3.2; 95% CI: 1.8–5.6) (28,29). Similarly, higher educational attainment is associated with increased PCC use. Women with secondary or higher education had approximately twice the odds of utilizing PCC compared with women with no formal education (46% versus 22%; AOR ≈ 2.1; 95% CI: 1.5–2.9) (30).

Knowledge and awareness of preconception health interventions strongly predict service uptake. Women with adequate understanding of folic acid supplementation, disease screening, and lifestyle modification were significantly more likely to seek PCC (AOR = 2.8; 95% CI: 1.9–4.2) (31). Conversely, lack of awareness remains a major barrier in many low-resource settings.

Finally, barriers related to service delivery, implementation, and sociocultural practices continue to reduce PCC utilization. Studies from low-resource areas indicate that poorly trained healthcare

providers, cultural norms, and limited accessibility lead to low coverage, with only 21–28% of women reporting any PCC use (32,33).

CHAPTER 3: METHODS AND MATERIALS

3.1. Study Area

The study was conducted in public health institutions in Wolkite town, the administrative capital of the Gurage Zone, is located in the Central Ethiopia Regional State (formerly part of the Southern Nations, Nationalities, and Peoples' Region). It lies approximately 155–158 kilometers southwest of Addis Ababa along the main Addis Ababa – Jimma, making it an important commercial and administrative hub in central Ethiopia. The town is situated at an altitude ranging from 1,910 to 1,935 meters above sea level, with an average annual temperature of about 18.6°C and an annual rainfall of approximately 1,244 mm. These moderate climatic conditions are favorable for both urban living and agricultural activities in the surrounding rural areas.

More recent projections from 2022 estimate the town's population at around 120,368 (Male = 60,149, Female = 60,219). Women of reproductive age (15–49 years): ~ 13,568 women. And pregnant women (estimated at a point in time): ~ 2,128 women.

The town is administratively divided into three sub-cities, containing 6 kebeles. In the town there are a total of 14 public health facilities and further quantified as one teaching and referral hospital, three health centers, 10 health posts. Health services such as antenatal care (ANC), family planning, immunization, and child health programs are provided free of charge in public institutions. Wolkite also serves as a referral center for nearby rural woredas, offering maternal, neonatal, and child health services to a larger catchment population.

The socio-demographic diversity, expanding health infrastructure, and ongoing urban growth of Wolkite town create both opportunities and challenges for maternal health interventions.

3.2. Study Period

The study was conducted from December 1, 2025 to January 31, 2026.

3.3. Study Design

Multicenter institutional based cross-sectional study design was employed to assess the utilization of preconception care and its determinants among pregnant women attending ANC at Wolkite town public health institutions.

3.4. Source Population

The actual study population consisted of all pregnant women in Wolkite town during the period of study.

3.5. Study Population

All pregnant women who attended antenatal care services at selected health institutions in Wolkite town during the data collection period and who met the study inclusion criteria.

3.5.1 Inclusion Criteria:

Pregnant women who attended ANC services at selected health institutions in Wolkite town during the study period and who gave consent to participate in the study were included.

3.5.1. Exclusion Criteria:

Pregnant women attended ANC who were seriously ill, in labor, or unable to communicate during data collection, and those who declined to participate were excluded from the study.

3.6. Sample Size Determination

For the first objective (prevalence), the sample size was calculated using the single population proportion formula:

$n = (Z\alpha/2)^2 * P(1-P) / d^2$

Where:

n = Minimum sample size

Z = Standardized normal distribution value for 95% confidence level (1.96)

d = Margin of error tolerated (5% or 0.05)

P = Prevalence of PCC, taken as 27.9% (0.279) from a study in Gondar, Ethiopia (Desalegn SY, et.al, 2023).

$n = (1.96)^2 * 0.279(1-0.279) / (0.05)^2 = 309$

Adding a 10% non-response rate (31), the final sample size is 340.

For the second objective (Determinants), sample size was calculated using Epi Info statistical software based on variables from previous studies.

The sample size was calculated using a double population proportion formula:

$$n = (Z_{\alpha/2}+Z_{\beta})^2 * (p_1(1-p_1)+p_2(1-p_2)) / (p_1-p_2)^2,$$

Where $Z_{\alpha/2}$ is the critical value of the Normal distribution at $\alpha/2$ (e.g. for a confidence level of 95%, α is 0.05 and the critical value is 1.96), Z_{β} is the critical value of the Normal distribution at β (e.g. for a power of 80%, β is 0.2 and the critical value is 0.84) and p_1 and p_2 are the expected sample proportions of the two groups.

Calculated sample sizes for determinants and adjusted for 10% non-response:

Table 1: Calculated sample sizes for determinants and adjusted for 10% non-response for P1 and P2 extracted from a previous study. (5,6,7,34)

Determinants	n per group	Total n	Adjusted Total n (10% non-response)
Good knowledge	54	108	119
Favorable attitude	174	348	383
Chronic medical illness	25	50	55
Counseled on PCC	230	460	506
Ever used modern FP	331	662	728
Intimate partner violence	186	372	409
Residence (Urban)	267	534	587
Age ≥35	48	96	106

Final recommended sample size: 728 participants (largest among all determinants after adjusting for 10% non-response).

3.7. Sampling Procedure

From 2017 E.C. Zonal similar months reports (N = 2,496 Pregnant women had ANC contacts at once).

The calculated sample size of 728 was distributed proportionally across the four public health institutions in the town depending on their patient load using multi-staged sampling technique. A multistage sampling technique was used. Public Health institutions providing ANC services were included, proportional allocation of sample size was applied based on client flow, and multi-stage systematic random sampling was employed. Based on the average daily ANC attendance, the sampling interval (3) was calculated. Every 3rd eligible woman was recruited until the desired sample size is reached.

Facility Selection: All public health facilities providing antenatal care (ANC) in Wolkite town was identified.

Proportional Allocation: The total sample size was allocated to each facility based on average monthly ANC client flow using the formula:

$$n_i = \frac{N_i}{N_{total}} \times n$$

Where: -

n_i = sample size for facility i

N_i = average monthly ANC attendees at facility i

N_{total} = total ANC attendees across all selected facilities

n = total calculated sample size

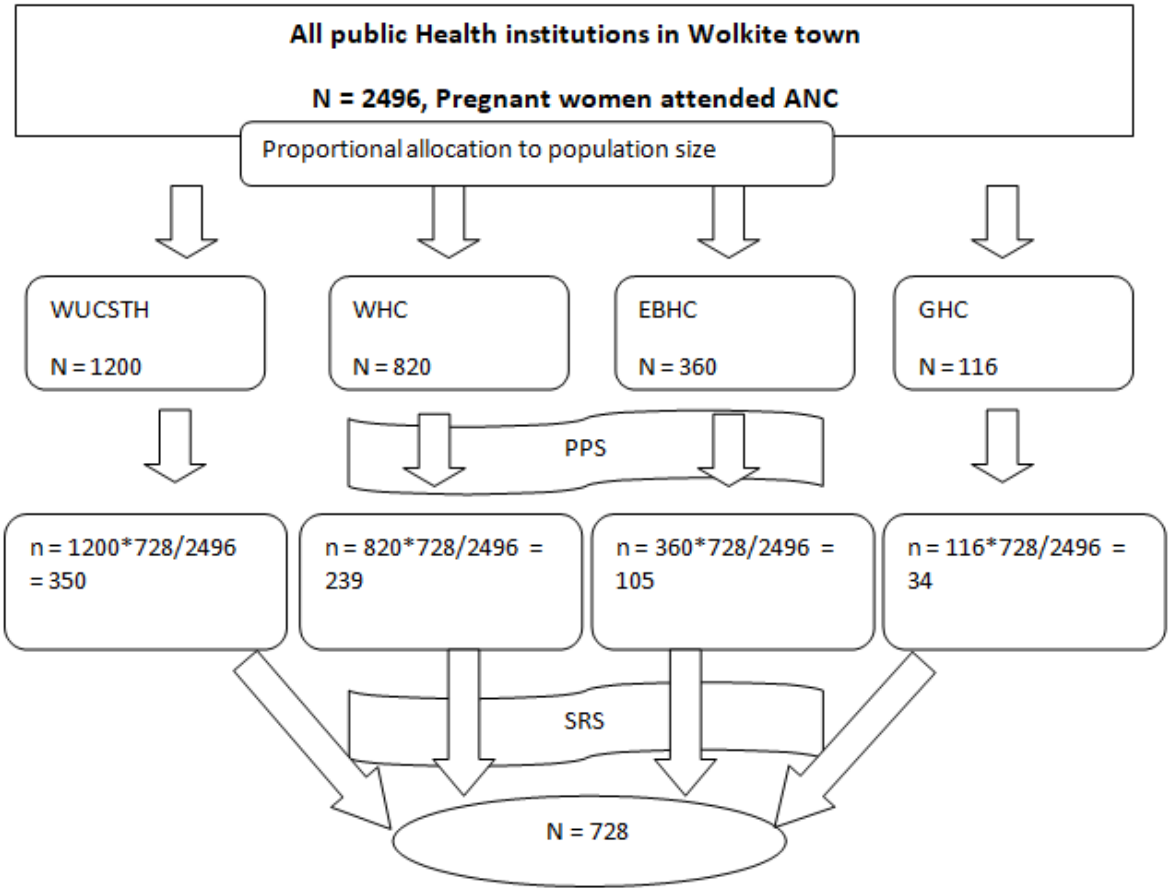


Figure 2: Schematic representation of sampling procedure among pregnant women attended ANC at Wolkite town, Central Ethiopia, February, 2026.

Participant Selection within Facilities: Systematic random sampling was applied. Sampling interval (k) was calculated as ($k = N_i/n_i$) = 3. A random start between 1 and (k) was chosen, and every 3 attendee was invited to participate.

Eligibility Screening: Selected participants were screened for inclusion and exclusion criteria

Non-Response Replacement: If a selected participant was ineligible or refused, the next attendee was approached to maintain the sample size.

This approach ensure a representative and unbiased sample of pregnant women attended ANC in Wolkite town, enabling accurate estimation of preconception care utilization and identification of determinants.

3.8. Study Variables

3.8.1. Dependent Variable:

- Utilization of preconception care

3.8.2. Independent Variables:

- Socio-demographic factors
- Obstetric and reproductive health factors
- Knowledge of PCC
- Behavioral intensions/ past use
- Health System Factor

3.9. Data Collection Tools and Procedures

Data was collected using a pre-tested semi-structured interviewer-administered questionnaire developed from reviewed literature. The tool was prepared in English and translated into Amharic, then back-translated to ensure consistency.

Sections of the tool included:

1. Socio-demographic factors
2. Obstetric and reproductive health factors
3. Knowledge of PCC
4. Behavioral intensions/ past use
5. Health System Factor

Four trained General practitioners and midwives collected the questionnaires, supervised by one senior Resident.

3.10. Data Processing and Analysis

Data entered into SPSS version 25 for analysis. Descriptive statistics (frequency, percentage, mean) described participant characteristics and PCC utilization. Bivariate logistic regression was

identified potential predictors ($p < 0.25$). Variables with $p < 0.25$ were entered into multivariable logistic regression to identify independent predictors. Statistical significance was declared at $p < 0.05$.

3.11. Data Quality Control

The questionnaire was pre-tested on 5% (37) of the sample at Albir Hassen Unjamo Health center. Training was given to data collectors and supervisors for two days. After pretesting an effort was made to fill the information gaps by looking for another complementary data sources Daily supervision and random spot checks were ensured quality. Completed questionnaires were checked daily for completeness and consistency.

3.12. Ethical Considerations

Ethical clearance was obtained from the Wolkite University Ethical review committee. Permission was obtained from public health institutions in Wolkite town. Informed verbal and/or written consent was secured from each participant. Confidentiality was ensured through the use of codes and anonymous data handling.

3.13. Dissemination of Findings

The findings of this study will be disseminated to maximize their impact on maternal and child health policy and practice. The results will be shared with the Wolkite Town Health Office and the respective public health facilities involved in the study to inform local preconception care (PCC) interventions. Additionally, the study findings will be presented at academic conferences and seminars to engage health professionals, researchers, and stakeholders. Efforts will also be made to publish the results in a peer-reviewed journal to contribute to the broader scientific evidence on PCC utilization and its determinants in Ethiopia. Participants' confidentiality will be maintained, and no individual identifiers will be disclosed in any dissemination activities.

CHAPTER 4: RESULT

Socio-Demographic Characteristics of Study Participants

In this study, 728 pregnant women were included, giving a response rate of 100%. The mean age of the participants was 27.68 years (SD ± 5.25) and 80.6% of respondents were between the age group of 20 to 34 years. The majority, (44.2%) and (99.5%) of the women were Orthodox Christians by religion and married respectively. The majority, (50.8%) and (50%) of the study participants were Gurage by ethnicity and housewives respectively. Moreover, (29%) of pregnant women and (36.3%) of their husbands were attend above secondary education respectively (Table 1).

Table 2: Distribution of study subjects by socio-demographic characteristics in Wolkite town, Central Ethiopia, February 2026(n=728)

Variables	Response	Frequency	Percent
Age of respondents	< 20	31	4.3
	20-34	587	80.6
	>34	110	15.1
Respondent's educational level	No formal education	91	12.5
	Primary education	217	29.8
	Secondary education	209	28.7
	Above secondary education	211	29.0
Religion	Orthodox	322	44.2
	Muslim	288	39.6
	Protestant	89	12.2
	Catholic	28	3.8
Marital status	Married	724	99.5
	Single	2	0.3
	Divorced	2	0.3
Ethnicity	Gurage	370	50.8
	Oromo	90	12.4
	Amhara	197	27.1
	Tigre	2	.3
	Kebena	42	5.8
Respondent's occupation	Housewife	364	50.0
	Government employee	182	25.0
	Merchant	67	9.2
	Student	21	2.9
	Daily laborer	14	1.9
	Private job	41	5.6
	Farmer	28	3.8

Income per Month	< 20,000	601	82.5
	≥20,000	127	17.4
Husband's Educational level	No formal education	66	9.1
	Primary education	201	27.6
	Secondary education	197	27.1
	Above secondary education	264	36.3
Husband's occupation	Government employee	214	29.4
	Merchant	151	20.7
	Daily laborer	69	9.5
	Private job	103	14.1
	Farmer	146	20.1
Family size	</= 3	376	51.6
	4-6	320	44.0
	>/=7	32	4.4

Obstetrics, Reproductive and medical factors

More than half of the respondents, 429 (58.9%), had experienced 2–4 pregnancies, while 182 (25.0%) were primigravida. A smaller proportion, 117 (16.1%), reported five or more pregnancies, suggesting a notable subgroup with high gravidity.

In terms of adverse pregnancy outcomes, 177 women (24.3%) reported a history of abortion, representing nearly one-quarter of participants. A history of stillbirth was reported by 33 women (4.5%), while preterm birth history was relatively uncommon at 11 (1.5%). Additionally, 15 women (2.1%) reported previous congenital abnormalities, and 29 (4.0%) had experienced neonatal death, indicating a measurable burden of prior adverse neonatal outcomes.

Concerning reproductive health practices, 262 respondents (36.0%) reported prior contraceptive use, meaning the majority (64.0%) had not previously used contraception before the current pregnancy.

81 (11.1%) of respondents had a chronic health problem and from those who had chronic health problem 37 (45.68%) of them were known hypertensive patients. 64(79%) of participants who had chronic health problem received preconception care**.** Among those who received preconception care majority 154(98.7%) counseled, 146(94.2%) given Folic acid, 115(73.7%) of them get drug adjustment.

Preconception care knowledge

Nearly half of respondents 347(47.7%) had ever heard of preconception care (PCC). Among those aware, health workers were the main information source (29.4%), followed by social media (15.9%), while schools and friends/family contributed minimally. Regarding the beneficiaries of PCC, 41.9% correctly indicated that care is needed for both mother and baby, whereas 28.2% did not know. Concerning who PCC is important for, two-thirds (66.2%) correctly reported both men and women, while 26.5% were uncertain. More than half of respondents (56.9%) believed PCC benefits couples, although 10% reported it does not. Overall, these findings suggest moderate awareness but persistent knowledge gaps about preconception care.

Table 3 Distribution of study subjects by Knowledge of respondents, February 2026(n=728)

Variables	Frequency	Percent (%)
Ever heard about PCC (n=728)		
Yes	347	47.7
No	381	52.3
Information heard from(n=347)		
Health workers	212	29.1
School	22	3
Social media	117	16.1
Friends and family	26	3.6
Other	7	1
For whom do you think preconception care is needed (n=347)		
For mother only	108	14.8
For baby and mother	235	32.3
Don't know	4	.5
For whom do you think Preconception care is important (n=347)		
For women only	2	.3
For men and women	342	47.0
Don't know	3	.4
Do you think that preconception care will benefit the couples (n=347)		
Yes	317	43.5
No	7	1.0
Don't know	23	3.2

Level of women's knowledge on preconception care was measured based on correct response using five preconception care knowledge questions and the question was scored out of 16 points women's knowledge was categorized by using 50% as cut of point. The minimum and maximum score of participants was 0 and 16 respectively. Participants scored %0% and above were categorized as having good knowledge. The reliability of the tool was acceptable (Cronbach's alpha = 0.78). Overall, approximately 53% of respondents demonstrated good knowledge of preconception care.

Utilization of preconception care

One hundred fifty six (21.4%) women's were utilized preconception care services. 72 (9.9%) of the participants who received of preconception care faced challenges during care. Among the participants who faced challenges majority 35(4.8%) told consumption of extended time during care provision and lack of privacy assurance and shortage of material supplies 18(2.5%) each.

Among the study participants who heard about PCC majority 254(34.9%) had support from their husbands for preconception screening. Among those who had no support 65 (8.9%) of the husbands were reported due to lack of knowledge on how preconception care benefits the couples.

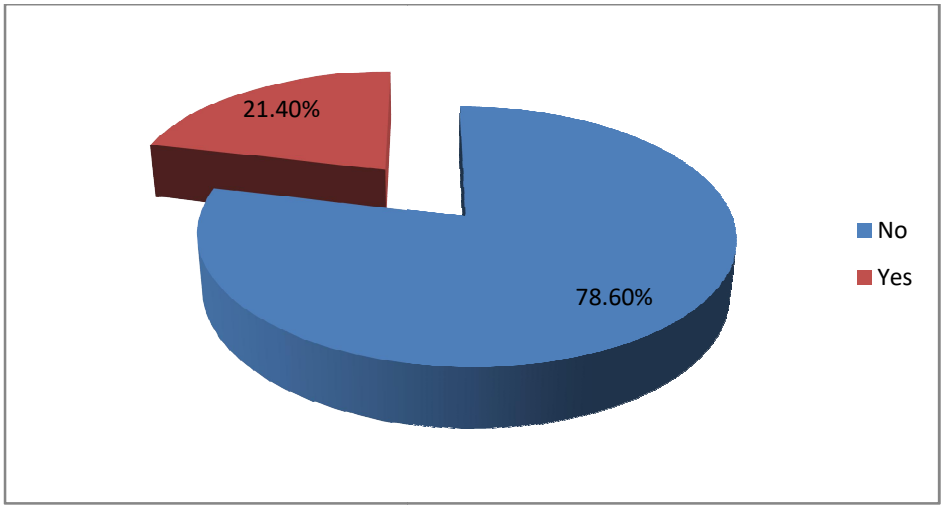


Figure 3: Utilization of preconception care among pregnant women attending Antenatal care in Wolkite town, Central Ethiopia, February 2026 (n=728)

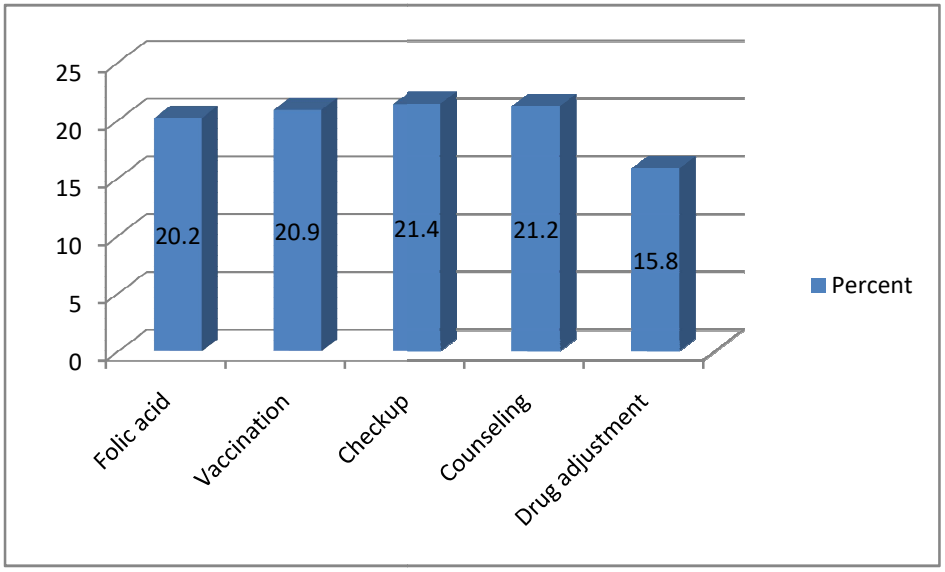


Figure 4: Type of preconception care taken among pregnant women attending Antenatal care in Wolkite town, Central Ethiopia, February 2026 (n=156)

Reason for non-utilization of preconception care

Among respondents who had not used preconception care services (n = 572; 78.6% of the total sample), the primary reason was lack of awareness, reported by 442 women (60.7%). Other reported barriers were considerably less frequent. Service unavailability accounted for 66 respondents (9.1%). Financial constraints were less commonly reported, with 23 respondents (3.2%) citing cost as a barrier. Cultural factors contributed to non-use in 22 respondents (3.0%), while other unspecified reasons accounted for 19 respondents (2.6%).

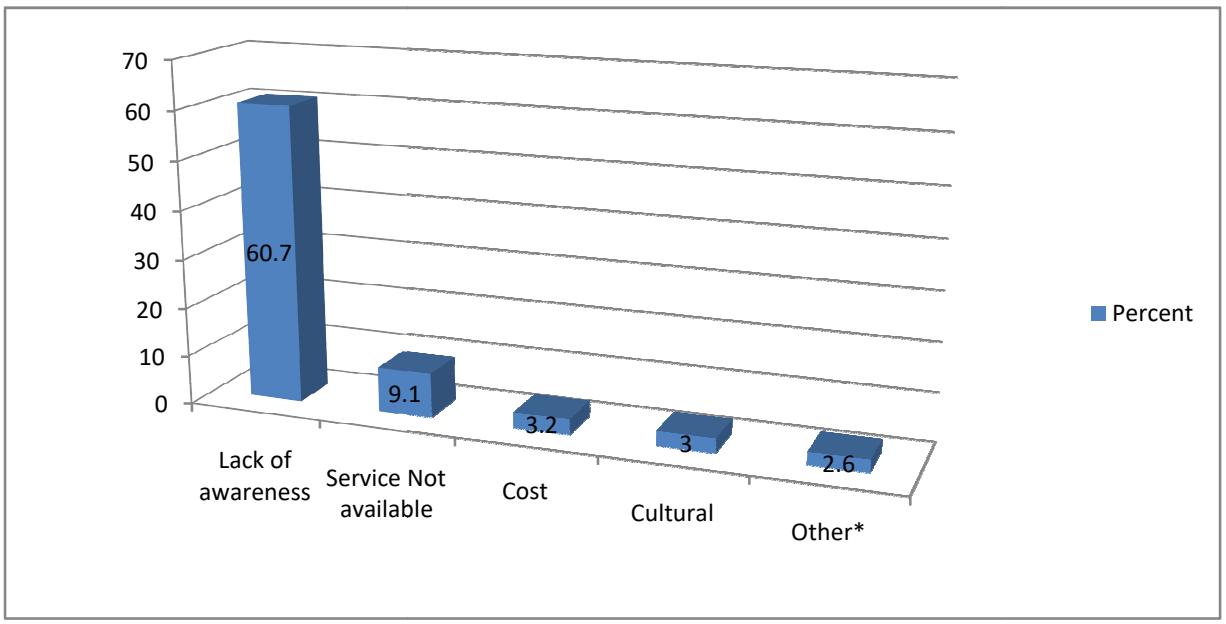


Figure 5: Reason for not using preconception care among pregnant women attending Antenatal care in Wolkite town, Central Ethiopia, February 2026 (n=572)

Health facility related factors

Out of 728 respondents, only 20.5% reported that medication was adequate. About 40.2% of respondents live within 30 minutes of a health facility. Only 19.4% reported availability of a room for PCC.

Table 4: Health care related factors of preconception care among pregnant women attending Antenatal care in Wolkite town, Central Ethiopia, February 2026 (n=572)

Variables	Frequency	Percent
Is there adequate medication?		
Yes	149	20.5
No	228	31.3
Don't know	351	48.2
Approximately how many minutes does it take to reach nearby health facility?		
</=30 minutes	293	40.2
>30 minutes	435	59.8
Is there available room for delivery of Preconception care alone?		
Yes	141	19.4
No	154	21.2
Don't know	432	59.4

Factors associated with utilization of preconception care

In the Bivariate analysis, independent variables having p-value less than or equal to 0.25 were considered as a candidate for multivariate analysis. According to these criteria women's age, education and occupation, marital status, Total household income per month, knowledge of women about preconception care services, history bad pregnancy outcome, history of contraceptive use, Preexisting chronic medical problem, availability of adequate medication, availability of unit for preconception care were variables that are candidate for multivariate analysis.

Table 5: Bivariable analysis of pregnant women attended Antenatal care in Wolkite town, Central Ethiopia, February 2026 (n=728)

Variable	Category	Utilization of PCC		COR, (95% CI)	P-value (<0.25)
		Yes	No		
Age (years)	<20	3	28	0.47 (0.14–1.57)	0.221
	20–34	109	478	1.00	1.000
	≥35	46	64	3.15 (2.05–4.86)	<0.001
Education	No formal	9	82	0.17 (0.08–0.36)	<0.001
	Primary	26	191	0.21 (0.13–0.35)	<0.001
	Secondary	41	168	0.38 (0.25–0.60)	<0.001
	Above secondary	82	129	1.00	1.000
Occupation	Housewife	62	302	1.00	1.000
	Government employee	57	125	2.22 (1.47–3.37)	0.0002
	Merchant	7	60	0.57 (0.25–1.30)	0.182
	Private job	15	26	2.81 (1.41–5.61)	0.003
	Daily laborer	3	11	1.33 (0.36–4.90)	0.670
	Farmer	9	19	2.31 (1.00–5.34)	0.051
	Student	0	21	0.11 (0.01–1.88)	0.129
Income (ETB/month)	<20,000	48	551	1.00 (Ref)	-
	≥20,000	108	21	59.05 (34.0–102.4)	<0.001
Knowledge	Good	144	203	18.7 (9.7–22.3)	<0.001
	Poor	14	367	1.0	–
Preexisting Medical condition	Yes	64	17	21.92 (12.30–39.04)	<0.001
	No	95	553	1.00	1.000
Total pregnancies	1	21	161	1.0	–
	2–4	102	327	2.40 (1.43–4.03)	0.002
	≥5	35	82	3.28 (1.69–6.36)	<0.001
Contraceptive use	Yes	129	133	14.7 (9.7–22.3)	<0.001
	No	29	437	1.0	–
Abortion	Yes	51	16	1.68 (1.16–2.36)	0.006
	No	107	444	1.0	–
Still birth	Yes	7	26	0.97 (0.39–2.41)	0.95
	No	151	544	1.0	–
Preterm birth	Yes	4	7	2.04 (0.51–8.20)	0.31*
	No	154	563	1.0	–
Congenital abnormality	Yes	4	11	1.33 (0.37–4.81)	0.67*
	No	154	559	1.0	–
Neonatal death	Yes	12	17	3.27 (1.18–9.07)	0.022
	No	146	553	1.0	–
Husband support	No	106	453	0.53 (0.37–0.76)	0.001
	Yes	52	117	1.0	–
Adequate medication?	Yes	24	125	0.51 (0.31–0.82)	0.006
	No	63	165	1.0	–
	Don't know	71	280	0.48 (0.32–0.72)	<0.001

Distance from nearby institution	<30	128	165	10.5 (6.7–16.4)	<0.001
	>30	30	405	1.0	–
Room for PCC	Yes	52	89	2.4 (1.5–3.9)	<0.001
	No	43	112	1.0	–
	Don't know	63	369	0.88 (0.59–1.30)	0.52

Multivariable analysis

In the bivariable analysis, PCC utilization was significantly associated with age, education, occupation, income, preexisting medical conditions, parity, contraceptive use, prior bad pregnancy outcome, husband support, health facility factors, and prior awareness of PCC. Women aged ≥35 years had 3.15 times higher odds of utilizing PCC compared to women aged 20–34 years (COR = 3.15; 95% CI: 2.05–4.86). Higher education and income were strongly associated with PCC uptake. Women with a history of contraceptive use (COR = 14.7; 95% CI: 9.7–22.3) or preexisting medical conditions (COR = 21.9; 95% CI: 12.3–39.0) were more likely to use PCC. Health system factors, including proximity to a health facility (<30 min) and awareness of PCC services, also significantly increased the likelihood of utilization.

Table 6: Multivariable analysis of determinants of utilization of PCC in Wolkite town, Central Ethiopia, 2026(n=728)

Variable	Category	Utilization of PCC		COR, (95% CI)	P-value (<0.25)	AOR, (95% CI)	P-value <0.05
		Yes	No				
Age (years)	<20	3	28	0.47 (0.14–1.57)	0.221	0.42 (0.12–1.50)	0.18
	20–34	109	478	1.00	1.000	1.00	1.000
	≥35	46	64	3.15 (2.05–4.86)	<0.001	2.78 (1.75–4.42)	<0.001
Education	No formal	9	82	0.17 (0.08–0.36)	<0.001	0.35 (0.15–0.81)	0.014
	Primary	26	191	0.21 (0.13–0.35)	<0.001	0.42 (0.23–0.78)	0.006
	Secondary	41	168	0.38 (0.25–0.60)	<0.001	1.95 (1.20–3.18)	0.007
	Above secondary	82	129	1.00	1.000	3.10 (2.01–4.78)	<0.001
Occupation	Housewife	62	302	1.00	1.000	1.00	1.000
	Government employee	57	125	2.22 (1.47–3.37)	0.0002	1.85 (1.18–2.91)	0.008
	Merchant	7	60	0.57 (0.25–1.30)	0.182	2.31 (1.10–4.84)	0.026
	Private job	15	26	2.81 (1.41–5.61)	0.003	1.92 (0.77–4.77)	0.16
	Farmer	9	19	2.31 (1.00–5.34)	0.051	1.00	1.000
Income (ETB/month)	<20,000	48	551	1.00 (Ref)	-	0.017 (0.010–0.029)	<0.001
	≥20,000	108	21	59.05 (34.0–102.4)	<0.001	6.38 (3.12–13.04	<0.001
Knowledge	Good	144	203	18.7 (9.7–22.3)	<0.001	16.5 (9.2–29.6)	<0.001
Preexisting Medical condition	Yes	64	17	21.92 (12.30–39.04)	<0.001	12.8 (6.7–24.5)	<0.001
Contraceptive use	Yes	129	133	14.7 (9.7–22.3)	<0.001	13.2 (8.1–21.6)	<0.001
Husband support	No	106	453	0.53 (0.37–0.76)	0.001	1.88 (1.20–2.94)	0.005
Distance <30 min	<30	128	165	10.5 (6.7–16.4)	<0.001	9.8 (5.8–16.4)	<0.001

In multivariate logistic regression, the study found that the overall utilization of preconception care (PCC) was significantly associated with several sociodemographic and reproductive factors. Women aged ≥35 years were nearly three times more likely to utilize PCC compared to those aged 20–34 years (AOR = 2.78; 95% CI: 1.75–4.42). Higher maternal education, being a government employee or merchant, higher monthly income (≥20,000 ETB), prior knowledge of PCC, contraceptive use, preexisting medical conditions, husband support, and shorter distance to health facilities (<30 minutes) were all positively associated with PCC utilization. Conversely, women with no formal education or primary education were less likely to use PCC. These findings highlight the importance of awareness, socioeconomic status, and access factors in promoting PCC uptake.

Husband support appeared protective (AOR = 1.88; 95% CI 1.20–2.94), suggesting that women without spousal support were less likely to utilize PCC.

CHAPTER 5: DISCUSSION

Utilization of PCC

This study assessed the utilization of preconception care (PCC) among pregnant women attending antenatal care in Wolkite town, Central Ethiopia. The overall prevalence of PCC utilization was 21.4%, meaning that approximately 1 in 5 women received at least one preconception service before pregnancy, while nearly 78.6% entered pregnancy without any preconception intervention. This clearly indicates substantial missed preventive opportunities prior to conception.

The utilization rate of 21.4% observed in this study is markedly lower than reports from high-income countries such as the United States, where PCC coverage ranges between 33% and 55%, representing roughly one-third to one-half of women receiving services before pregnancy (2). In contrast, the Netherlands has reported uptake levels exceeding 60%, meaning nearly three out of five women utilize structured preconception services (10). Compared to these figures, the utilization rate in Wolkite town is approximately 2–3 times lower, underscoring major disparities in preventive maternal health integration between high-income and low-resource settings.

Within Sub-Saharan Africa, the present finding (21.4%) aligns closely with regional estimates. Studies conducted in Nigeria and Kenya reported PCC utilization ranging between 15% and 25%, placing Wolkite town within this continental range (11,23). For example, utilization in Nigeria has been documented at approximately 14–20%, slightly lower than the 21.4% observed in this study (11). Kenyan facility-based studies reported uptake around 23–25%, marginally higher than the current finding but still within a similar low-coverage category (23). In Uganda, utilization ranged between 11% and 18%, indicating that Wolkite's prevalence is slightly higher than some Ugandan settings but still reflects overall low regional uptake (29).

Within Ethiopia, the 21.4% prevalence is comparable to reports from Addis Ababa, where utilization ranged between 20% and 38%, depending on study population and setting (5). However, it is notably higher than findings from Debre Birhan, where utilization ranged between 13% and 17%, representing nearly one-third lower coverage compared to Wolkite (30). Conversely, the prevalence remains lower than in Hawassa, where utilization ranged between

27% and 30%, approximately 6–9 percentage points higher than the current study (24). These inter-regional differences likely reflect variations in urbanization, socioeconomic status, awareness levels, and service accessibility.

Several contextual explanations may account for the relatively low uptake observed in Wolkite town. The World Health Organization recommends integration of preconception interventions including folic acid supplementation, chronic disease screening, and behavioral counseling—into routine reproductive health services (3). Despite this recommendation, implementation remains inconsistent across low-resource settings. Additionally, globally approximately 44% of pregnancies are unintended, limiting opportunities for preconception engagement (3). Structural and financial barriers, transportation limitations, and limited provider training may further contribute to underutilization (32,33).

The 21.4% utilization rate has important public health implications. Preconception interventions such as periconceptional folic acid supplementation can reduce neural tube defects by up to 70%, while optimized glycemic control prior to conception significantly reduces congenital anomalies (2,3). Given that nearly four out of five women in this study did not receive such preventive services, there remains substantial potential for improvement in maternal and neonatal health outcomes.

Overall, the findings demonstrate that PCC utilization in Wolkite town (21.4%) mirrors the broader Sub-Saharan African pattern of low uptake and remains substantially below levels reported in high-income countries.

Determinants of Preconception Care Utilization

Several factors were associated with PCC utilization in this study, reflecting socioeconomic, knowledge-based, income, preexisting medical conditions and health system influences.

Maternal Age

In this study, women aged ≥35 years were significantly more likely to utilize PCC (AOR = 2.78; 95% CI: 1.75–4.42). Utilization among women ≥35 years was 41.8%, compared with 18.6% among women aged 20–34 years and 9.7% among those <20 years.

This finding aligns with evidence from Hawassa, where women ≥35 years had higher PCC practice (34%) compared with younger women (18%) (17). Similar patterns were observed in Addis Ababa and Nigeria where utilization among women aged ≥30 years exceeded 25%, compared to substantially lower percentages among younger women (5, 11). Similarly, a study from Bangladesh reported increased engagement in preconception practices among women aged ≥30 years (16). A Sub-Saharan African systematic review further noted that older women are more likely to seek PCC due to heightened perception of obstetric risks (19). In the United States, women aged 30–44 years reported PCC coverage between 44% and 50%, nearly double the coverage observed in Wolkite town (2). In Uganda, overall utilization remained between 11% and 18%, with minimal variation across age categories (29).

However, contradictory findings were reported in Sri Lanka, where younger women (<30 years) had higher preconception counseling exposure (28%) than older women (19%) (14). Brazilian data also showed slightly higher preconception health behaviors among women aged 20–29 years (18.4%) (13). These differences may reflect variations in health education strategies and reproductive planning behaviors.

Educational Status

Education was strongly associated with PCC utilization. Women with above secondary education had 38.9% utilization, while only 9.9% of women without formal education utilized PCC. After adjustment, women with above secondary education were significantly more likely to utilize PCC (AOR = 3.10; 95% CI: 2.01–4.78).

Similar gradients were observed in Addis Ababa private MCH hospitals, where 48% of women with college education utilized PCC compared to 14% among those without formal education (5). In Sidama Region, utilization was 32% among women with secondary or higher education versus 11% among women without schooling (15). A Nigerian study also reported 45% utilization among women with tertiary education compared to 12% among those with primary education or less (20). Systematic reviews in Ethiopia consistently confirm education as a key determinant (1,22). Education enhances awareness, autonomy, and health-seeking behavior, consistent with global reproductive health frameworks (3).

Nonetheless, a Ugandan study reported no independent association between education and PCC after multivariable adjustment (29), suggesting contextual health system factors may modify this relationship.

Occupation and Income

Government employees had higher PCC utilization (31.3%) compared with housewives (17.0%), and this remained significant after adjustment (AOR = 1.85; 95% CI: 1.18–2.91). Merchants were also more likely to utilize PCC (AOR = 2.31; 95% CI: 1.10–4.84).

In this study, monthly income was a strong and significant predictor of preconception care (PCC) utilization. Women earning ≥20,000 ETB per month were 6.4 times more likely to utilize PCC services compared to those earning less than 20,000 ETB (AOR = 6.38; 95% CI: 3.12–13.04; $P < 0.001$).

Comparable socioeconomic gradients were observed in Mizan Aman, where high-income women had 35% utilization versus 12% among low-income women (8). In Addis Ababa, higher-income women demonstrated 41% utilization compared to 16% among lower-income groups (28). Similarly, in Uganda, women in the highest wealth quintile had 38% utilization versus 14% in the lowest quintile (29).

However, in West Guji Zone, income was not independently associated with PCC utilization (7), possibly due to free public service availability reducing financial barriers. Addis Ababa studies reported utilization between 20–38%, with limited variation across income categories after adjustment (5).

Knowledge and Awareness of PCC

Women who had Good knowledge about PCC were significantly more likely to utilize services (AOR = 16.5; 95% CI: 9.2–29.6). This finding is consistent with Debre Birhan study, where knowledgeable women had 39% utilization versus 10% among those with poor knowledge (30). In Hawassa, good knowledge was associated with 37% utilization compared with 13% among women with poor knowledge (17). In Fiche Town, knowledgeable women showed 43% utilization compared to 9% among those unaware (22).

National systematic reviews confirm knowledge as the most consistent determinant of PCC uptake in Ethiopia (1,22). Additionally, in South Africa, 62% of women cited lack of awareness as the primary barrier to PCC utilization (33).

Preexisting Medical Conditions

Women with preexisting medical conditions had 79.0% utilization and were significantly more likely to use PCC (AOR = 12.8; 95% CI: 6.7–24.5).

This is consistent with findings among HIV-positive women in Southern Ethiopia, where 52% utilized PCC compared with 18% among HIV-negative women (32). A systematic review in Sub-Saharan Africa also reported greater PCC engagement among women with chronic conditions due to increased clinical follow-up and risk perception (19). Intervention studies further demonstrate improved maternal outcomes when high-risk women receive structured preconception interventions (32).

However, Ethiopian community-based findings reported utilization below 20%, even among women with chronic illness (30).

Contraceptive Use

Contraceptive users were significantly more likely to utilize PCC 49.2% (AOR = 13.2; 95% CI: 8.1–21.6). Similar findings were observed in Hosanna (45% vs 15%) [9] and West Guji (39% vs 12%) (7). Integration of preconception counseling within family planning services has been recommended to improve uptake (2).

In Kenya, utilization among contraceptive users reached approximately 23–25%, compared to lower proportions among non-users (23). Ethiopian studies reported overall utilization below 30%, with relatively higher uptake among contraceptive users (30).

In Nigeria, overall utilization ranged between 14–20%, with limited variation by contraceptive history (11).

Husband Support

In this study, women who reported husband support were more likely to utilize PCC services, with 38% of women with husband support using PCC compared to 25% among those without support, representing a 13-percentage point difference (AOR = 1.88; 95% CI: 1.20–2.94).

This aligns with findings from Northern Ethiopia showing higher awareness and service engagement among women supported by their husbands (27). Evidence from East Africa showing that male partner involvement positively influences maternal health service uptake. A systematic review reported that male engagement increased maternal service use by approximately 30–50% (23,24).

However, in Addis Ababa, husband involvement was not independently associated with utilization after adjustment (28), possibly reflecting greater female autonomy in urban settings.

Distance to Health Facility

Women living within 30 minutes of a health facility were significantly more likely to utilize PCC 43.7% (AOR = 9.8; 95% CI: 5.8–16.4). Geographic accessibility has been consistently linked with maternal health service utilization in Ethiopia (26). Structural barriers, including travel time and transportation challenges, remain critical obstacles in low-resource settings (33).

However, Ethiopian community-based findings reported utilization below 20%, even among women with chronic illness (30).

Overall, these findings confirm that PCC utilization in this study is strongly shaped by **socioeconomic, informational, and health system factors**. Comparisons with recent Ethiopian and regional studies (2024–2025) demonstrate broadly consistent patterns, though income effects appear particularly pronounced in this urban central Ethiopian context. Therefore, targeted

interventions to improve awareness, address financial and structural barriers, and involve male partners could significantly enhance PCC uptake.

The findings of this study are consistent with Andersen's Behavioral Model of Health Service Utilization, which posits that health service use is influenced by predisposing, enabling, and need-related factors. Educational status (predisposing), income level (enabling), and chronic medical conditions (need factor) were significantly associated with PCC utilization. Furthermore, the significant association between knowledge and PCC utilization supports the Health Belief Model, which suggests that perceived benefits and awareness of risk increase the likelihood of preventive health behavior. These findings indicate that both structural and perceptual factors influence preconception care uptake.

Limitations of the Study

The cross-sectional study design limits the ability to establish causal relationships. Recall bias may have occurred when respondents reported past service use or pregnancy outcomes. Facility-based sampling may exclude women not attending antenatal care, limiting generalizability to the wider community. Self-reported responses may introduce social desirability bias.

Strengths of the Study

This study has several important strengths. First, it achieved a 100% response rate, which minimizes non-response bias and enhances the credibility and representativeness of the findings. Second, the study used an adequate sample size, improving the precision of the estimated magnitude of preconception care (PCC) utilization and strengthening the statistical power to detect significant associations. Third, the application of multivariable logistic regression analysis allowed adjustment for potential confounders, thereby improving the internal validity of the identified determinants. In addition, the use of a structured questionnaire adapted from previously validated studies ensured consistency and comparability with similar national and international research. Furthermore, the study provides context-specific evidence on PCC utilization in Wolkite town public health institutions, an area where limited research has been conducted, making the findings valuable for local health planners and policymakers aiming to strengthen maternal and reproductive health services.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

Conclusion

This study assessed the utilization of preconception care (PCC) and determinants among pregnant women attending antenatal care in Wolkite town public health institutions, Central Ethiopia. The findings revealed that PCC utilization remains low.

Although nearly half of respondents had heard about PCC and lack of awareness was the primary reason for non-utilization. Service-related factors such as distance to health facilities, availability of services, and lack of dedicated PCC structures also contributed to low uptake.

Multivariable analysis showed that maternal age, education, household income, employment status, preexisting chronic medical conditions, contraceptive use, proximity to health facilities, and awareness of PCC services were significant predictors of PCC utilization. Women with chronic illnesses and those previously using contraceptives were especially more likely to seek PCC, indicating that contact with health services increases utilization opportunities. Lack of husband support also reduced service uptake, demonstrating the importance of partner involvement in maternal health decisions.

Overall, the study indicates that preconception care is not yet fully integrated into routine reproductive health services, and substantial gaps remain in awareness, accessibility, and service organization.

Recommendations

For the Ministry of Health and Regional Health Bureaus: - Develop national and regional PCC awareness campaigns targeting reproductive-age women and couples. Ensure availability of essential PCC services, supplies, and medications in health facilities.

For Health Facilities and Health Professionals: - Strengthen counseling on preconception care during family planning and antenatal visits. Provide continuous training for health professionals on PCC provision. Improve service organization and visibility of PCC services within facilities. Encourage male partner involvement in reproductive health services.

Integration of Preconception Care into Routine Services:- Preconception care should be integrated into existing maternal and reproductive health services, including family planning, antenatal care, and postnatal care. This approach can improve accessibility, awareness, and early detection of maternal and fetal risk factors.

Health Education and Awareness Programs:- Health authorities should strengthen community-based and facility-based health education about the importance of PCC. Emphasis should be placed on reaching women of reproductive age, particularly those with lower education or income levels, to address knowledge gaps that limit utilization.

Targeted Interventions for High-Risk Groups:- Programs should focus on older women, women with higher parity, and those from lower-income households, as these groups may have lower awareness or access to PCC services. Tailored counseling and follow-up strategies can improve uptake in these populations.

Capacity Building for Health Providers:- Healthcare providers should be trained to offer PCC as part of routine reproductive health care, including counseling on nutrition, chronic disease management, and lifestyle modification before conception.

Policy and Program Support:- Policymakers should develop and implement strategies to institutionalize PCC in all public health facilities, ensuring guidelines, resources, and monitoring systems are in place to sustain utilization and improve maternal and neonatal outcomes.

Further Research:- Additional studies are recommended to explore barriers and facilitators of PCC utilization in rural and urban settings, including qualitative, longitudinal, community-based, interventional researches and evaluate effectiveness of PCC integration strategies.

.

CHAPTER 7: REFERENCES

1. Ayele D, Belay H, Kassa B, Worke M. Knowledge and utilisation of preconception care and associated factors among women in Ethiopia: systematic review and meta-analysis. Reprod Health. 2021;18(1):78.
2. Johnson K, Posner SF, Biermann J, Cordero JF, Atrash HK, Parker CS, et al. Recommendations to improve preconception health and health care—United States. MMWR Recomm Rep. 2006;55(RR-6):1–23.
3. World Health Organization. Preconception care to reduce maternal and childhood mortality and morbidity. Geneva: WHO; 2013.
4. Zhou Q, Dong G, Wang Q, Shen H, Zhang S, Chen J, et al. Preconception folic acid supplementation for the prevention of birth defects: a prospective, population-based cohort study in mainland China. BMC Pregnancy Childbirth. 2024;24:114.
5. Girma A, Bedada A, Kumbi S. Utilization of preconception care and associated factors among pregnant women attending antenatal care in private MCH hospitals in Addis Ababa, Ethiopia. BMC Pregnancy Childbirth. 2023;23:649.
6. Abneh AA, Getahun WT, Agmassie GA, et al. The magnitude of preconception care utilization and associated factors among women in Ethiopia: systematic review and meta-analysis. BMC Pregnancy Childbirth. 2025;25:259.
7. Amaje E, Fikrie A, Utura T. Utilization of preconception care and its associated factors among pregnant women of West Guji Zone, Oromia, Ethiopia, 2021: community based cross sectional study. Health Serv Res Manag Epidemiol. 2022;9:23333928221088720.
8. Setegn Alie M, Alemu T, Alemayehu D, Negesse Y, Gebremariam A. Preconception care utilization and associated factors among reproductive age women in Mizan Aman town, Bench Sheko Zone, Southwest Ethiopia: a content analysis. PLoS One. 2022;17(8):e0273297.
9. Wegene MA, Gejo NG, Bedecha DY, Kerbo AA, Hagisso SN, Damtew SA. Utilization of preconception care and associated factors in Hosanna Town, Southern Ethiopia. PLoS One. 2022;17(1):e0261895.

10. Temel S, van Voorst SF, Jack BW, Denktas S, Steegers EA. Evidence-based preconceptional lifestyle interventions. Epidemiol Rev. 2014;36(1):19–30.
11. M'hamdi HI, van Voorst SF, Pinxten W, Hilhorst MT, Steegers EA. Barriers in the uptake and delivery of preconception care: exploring the views of care providers. Matern Child Health J. 2017;21(1):21–28.
12. Stephenson J, Heslehurst N, Hall J, Schoenaker DAJM, Hutchinson J, Cade JE, et al. Before the beginning: nutrition and lifestyle in the preconception period and its importance for future health. Lancet. 2018;391(10132):1830–41.
13. Borges ALV, Santos OAD, Nascimento NC, et al. Preconception health behaviors among Brazilian women: only 15.9% performed preconception care actions, underscoring low PCC utilization. Rev Esc Enferm USP. 2016;50(2):208–16.
14. Patabendige M, Goonewardene I. Preconception care received by women attending antenatal clinics at a teaching hospital in Southern Sri Lanka. Sri Lanka J Obstet Gynaecol. 2013;35(1):3–9.
15. Tiruye G, Asfaw A, Debella A, Gultie T, Shiferaw K. Preconception care utilization and associated factors in Sidama Region, Ethiopia: a community-based study. Int J Gynecol Obstet. 2025;171(2):850–60.
16. Ahmed F, Rahman M, Ali S. Influence of maternal age and education on preconception care practices. Reprod Health. 2022;19:112.
17. Ayalew Y, Mulat A, Dile M, Simegn A. Women's knowledge and associated factors in preconception care in Hawassa City, Ethiopia. PLoS One. 2017;12(12):e0188373.
18. Johnson S, Lee A, Kumar R. Effect of folic acid supplementation on maternal and fetal outcomes: a cohort study. J Obstet Gynaecol Res. 2021;47(5):1582–90.
19. Gebretsadik GG, Biratu AK, Gessessew A, Lassi ZSL, Kahsay AB, et al. Preconception health risks among women of reproductive age in Sub-Saharan Africa: a systematic review of implications for preconception care. J Health Popul Nutr. 2025;44:164.
20. Akinajo OR, Osanyin GE, Okojie OE. Preconception care: assessing the level of awareness, knowledge and practice among pregnant women in a tertiary facility in Nigeria. Niger Med J. 2019;60(2):87–92.
21. Smith J, Brown K. Alcohol reduction strategies among pregnant women: determinants and outcomes. Matern Child Health J. 2019;23(6):789–97.

22. Fetena N, Negash A, Kebede A, Sertsu A, Nega A, Nigussie K, et al. Utilization of preconception care and associated factors among pregnant mothers in Fiche Town, Central Ethiopia: a community based cross sectional study. Front Glob Womens Health. 2023;4:1159693.
23. Ditekemena JD, et al. Male involvement and reproductive health outcomes in East Africa: a systematic review and meta-analysis. BMC Public Health. 2024;24:462.
24. Fletcher R, Forbes F, Dadi AF, Kassa GM, Regan C, Galle A, Beyene A, et al. Effect of male partners' involvement and support on reproductive, maternal and child health and well-being in East Africa: a scoping review. Health Sci Rep. 2024;7(8):e2269.
25. Habte A, Dessu S, Haile D. Determinants of practice of preconception care among women of reproductive age group in southern Ethiopia, 2020: content analysis. Reprod Health. 2021;18(1):100.
26. Addisu E, Cherie N, Birhane T, Abegaz Z, Endawkie A, Mohammed A, et al. Rural urban disparities in full antenatal care utilization among women in Ethiopia: further analysis of Mini EDHS, 2019. PLoS One. 2024;19(1):e0310901.
27. Mulugeta Woldu A, Tadese Asresu T, Gebrehiwot W H. Husband support rises women's awareness of preconception care in Northern Ethiopia. Sci World J. 2020;3415795.
28. Getachew T, Taye A, Desta M. Preconception care utilization and associated factors among women in Addis Ababa, Ethiopia. Ethiop J Health Sci. 2020;30(3):363–72.
29. Kassa A, Human SP, Gemeda H. Level of preconception care utilization and associated factors among women in Uganda. Reprod Health. 2019;16:112.
30. Teshome F, Assefa N, Fekadu H, et al. Knowledge and practice of preconception care among women in Debre Birhan, Ethiopia. BMC Res Notes. 2018;11:871.
31. Ayele B, Asnake M, Gebremariam M, Birhanu M, Molla M. Preconception care use and associated factors among HIV positive reproductive age women attending ART clinics in Hadiya Zone, Southern Ethiopia: a mixed method study. BMC Public Health. 2024;24:19653.
32. Doke PP, Kotnis SD, Khandagale AD. Implementation of preconception care for preventing adverse pregnancy outcomes: a field intervention study. Prev Med Rep. 2024;33:102344.
33. Makhura M, Phiri P. Barriers to preconception care in low-resource settings: evidence from Limpopo Province, South Africa. Healthcare (MDPI). 2023;11:2586.

34. Desalegn SY, Aklil MB, Anteneh TA, Temesgan WZ. Determinants of Utilization of Preconception Care among Pregnant Women Attending Antenatal Care in Gondar Town, Northwest Ethiopia: A Multicenter Study. JOJ Nurse Health Care. 2023;13(2):555857.

CHAPTER 8: APPENDIX

Annex. Data collection tool

Participant ID ---------- Date of data collection ----------

Please encircle or enter in the appropriate space.

Part 1: Socio-Demographic characteristics/information of respondents among pregnant women attending ANC in Wolkite town, Central Ethiopia?

S.N	Questions	Possible answer	Code	Skip
1.1	What is your age in completed years?	_____Years		
1.2	What is the highest grade you have completed?	1. No formal education 2. Primary education 3. Secondary education 4. Above Secondary education		
1.3	What is your religion?	1. Orthodox 2. Muslim 3. Protestant 4. Catholic **5.** Other_____		
1.4	What is your marital status?	1. Married 2. Single **3.** Divorced 4. Widowed		
1.5	To which ethnic group do you belong?	**1.** Amhara **2.** Oromo **3.** Gurage **4.** Tigrae **5.** Other specify_____		
1.6	What is your occupation?	1. Housewife 2. Govt. employee 3. Market trade vendor 4. Student 5. Daily laborer 6. Other (Specify)_____		
1.7	How much is your total household income per Month from all sources? Including your husband/partner monthly income.	1. Birr_____ 2. Don't know		
1.8	What is your husband's educational level?	1. No formal education 2. Primary education 3. Secondary education 4. Above Secondary education		
1.9	What is the main occupation of your husband?	1. Govt. employee 2. market trade vendor 3. Daily laborer 4.Student		

		5. Other (Specify)……..	
1.10	What is your total family size?	…….	
1.11	What is the total number of pregnancies in your life time?	…….	
1.12	What is the total number of live births? (parity)	…….	
1.13	Have you ever had history of spontaneous abortion?	1. Yes 2. No	
1.14	Have you ever had history of still birth?	1. Yes 2. No	
1.15	Have you ever had history of preterm birth?	1. Yes 2. No	
1.16	Have you ever had history of congenital abnormality?	1. Yes 2. No	
1.17	Have you ever had history of neonatal death?	1. Yes 2. No	
1.18	Have you ever had history of contraceptive use?	1. Yes 2. No	

Part II: - Knowledge of preconceptional care among pregnant women Attending ANC in Wolkite town, Central Ethiopia?

			Code	Skip
2.1	Have you heard of preconception care service before?	1. Yes 2. No		If no skip to question no. 205
2.2	What is your initial source of information?	1. Health workers 2. School 3. Social media 4. Friends and family 5. Others……..		
2.3	Do you know the services that are rendered at preconception care service?	1. Yes 2. No		
2.4	What kinds of preconception care service do you know?	1. HIV testing and counseling 2. STI screening and treatment 3. Infertility/sub-fertility treatment 4. Nutrition 5. Iron supplementation 6. Immunization 7. Cessation of alcohol 8. cessation of smoking 9. Other (indicate)…		
2.5	For whom do you think preconception care is needed?	1. For men, only 2. For women, only 3. For men and women 4. Don't know		
2.6	For whom do you think Preconception care is important?	1. For baby, only 2. For mother, only 3. For baby and mother24. Don't know		

2.7	Do you think that preconception care will benefit the couples?	1. Yes 2. No		If yes, respond to question no.208?
2.8	Do you mention some of the benefits?	1. It is need to have safe pregnancy 2. It is beneficent to promote the health of future children 3. Improved maternal health 4. Reduce unplanned pregnancies and abortions 5. Economic benefits to the family and the community 6. Other (indicate) …		
2.9	Did you encountered challenges while in service for preconceptional screening?	1. Yes 2. No		If yes answer question no.210
2.10	What are the challenges you faced during preconceptional screening?	1. 1.negligence from health care providers 2. services are not integrated 3. consumption of extended time 4. lack of privacy assurance 5. 5.shortages of materials and supplies 6. 6. Other (indicate)……		
2.11	If you don't have a preconceptual screening why do you think is that?	1. Because, I didn't know as there was such a service 2. Health care providers didn't told me to have the service 3. I'm not certain that preconception will benefit me 4. Due to lack of integrated PCC 5. Other (indicate)……		
2.12	Do you have support from your husband for preconception care?	1. Yes 2. No		If no go to question no 213
2.13	Why do you think is the reason for his refusal towards care?	1.due to lack of knowledge on how the service benefits couples 2. attitudinal trouble 3. he looks that, time spent for prenatal care as a wastage 4. fear of wrong outlooks in the community 5. Other (indicate)……		

Part III: - Obstetric & reproductive health factors of respondents among pregnant women Attending ANC in Wolkite town, Central Ethiopia?

3.1	Do you have any preexisting chronic medical condition?	1. Yes 2. No		If **yes** respond to question no.302
3.2	Which type of chronic medical condition do you have?	1. Hypertension 2. Diabetes mellitus 3. Asthma 4. HIV/AIDS 5. Epilepsy 6. Other (indicate)……		
3.3	Did you consider participating in preconception counseling from your provider before you become pregnant?	1. Yes 2. No		If yes answer question no.304
3.4	Which type of preconception counseling do you receive?	1. Maintaining optimal weight control 2. Maintaining a regular exercise program 3. Maximizing diabetes mellitus control 4. Ceasing tobacco, alcohol, and drug use 5. Change/cessation of medication 6. Other (indicate)…		

Part IV. Behavioral Intentions / Past Use of respondents among pregnant women Attending ANC in Wolkite town, Central Ethiopia?

S.N				
4.1	Have you ever used any preconception service before this pregnancy?	1. Yes 2. No		
4.2	If yes, specify	1. Folic acid 2. Vaccination 3. Check-up 4. Counseling 5. Other [_____]		
4.3	Where did you receive PCC?	1. Health center 2. Hospital 3. Private clinic 4. Other [_____]		
4.4	When did you seek the service?	1. <3 months 2. 3–6 months 3. >6 months 4. Don't remember		
4.5	Reasons for not using PCC	1. Lack of awareness 2. Not available 3. Cost 4. Cultural		

		5. Other [_____]		
4.6	Would you use PCC in future pregnancies?	1. Yes 2. No		
4.7	Intend to seek PCC before next pregnancy?	1. Yes 2. No		
4.8	What motivates or prevents you from using PCC? _____			

Part V. Health facility related questions for respondents among pregnant women Attending ANC in Wolkite town, Central Ethiopia?

5.1	Availability of health facility? (health center, hospital)	1. Yes 2. No		If yes respond to question no.502
5.2	Is there Adequate medication?	1. Yes 2. No 3. don't know		
5.3	Approximately how many hours / km does it take to reach the nearby health facility?	_____km or _____walking hours		
5.4	Is it Available room for delivery of preconception care alone?	1.Yes 2. No 3. don't know		

WHO 2013, 16, FMOH 2022, Central statistics agency & ICF 2017s, Kassa et.al 2019, Mamo et.al 2021