



# Utilization of Maternal Health Services in Western Ethiopia: A Community-Based Cross-Sectional Study

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## Authors' contributions

This work was carried out in collaboration among all authors. Author TT conceived the study, participated in the design of the questionnaire, in drafting and finalizing the manuscript, and assisted with the design of the study and data analysis. Author DT conceived the study, its overall design and execution, designed the questionnaire, performed data collection, performed the statistical analysis, and served as the lead author of the manuscript. Authors RO and BE conceived the study, participated in the design of the questionnaire, performed the statistical analysis, drafted the manuscript, and assisted in the design of the study and data analysis. All authors read and approved the final manuscript.

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## ABSTRACT

**Background:** More than two-thirds of maternal deaths could be averted if all women had access to maternal health services. Thus, this study is aimed to assess the utilization and determinants of maternal health services among women who gave birth in the past 6 months in East Wollega, Western Ethiopia.

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**Methods:** A community-based cross-sectional study was conducted among 600 postpartum women. Data were collected through face-to-face interviews using pretested structured questionnaires, entered using Epi Info version 7.0, and analyzed by SPSS version 20. Descriptive analysis and logistic regressions were performed. The adjusted odds ratio with a 95% confidence interval was used, and statistical significance was declared at  $p$ -value  $<0.05$ .

**Results:** The study showed that coverage of antenatal care (ANC) was 40% in rural and 45% in urban areas. Sixty-one percent of participants in rural and 81.7% in urban gave birth at health institutions. The coverage of postnatal care (PNC) was 22% in rural and 18% in urban respectively. Provision of essential program services was low. Counseling during ANC and the presence of danger signs of pregnancy were associated with the utilization of maternal health services.

**Conclusion:** In this study, utilization of maternal health services was low. Given this low utilization and associated factors, it is recommended that counseling during ANC and awareness-raising about danger signs of pregnancy should be promoted.

**Keywords:** Maternal health; utilization; East Wollega.

## ABBREVIATIONS

ANC : Antenatal Care  
CSD : Cesarean Delivery  
EDHS : Ethiopian Demographic Health Survey  
ID : Instrumental Delivery  
PNC : Postnatal Care  
USD : United State Dollar  
VD : Vaginal Delivery

## 1. INTRODUCTION

“The pregnancy and childbirth process puts every woman at risk of complications. But 99% of maternal deaths that occur in developing countries like Ethiopia are avoidable” [1]. Ethiopia contributed to 3% to 5% of global maternal deaths annually [2]. “This shows maternal mortality is still high in Ethiopia according to the 2016 Ethiopian demographic Health survey (EDHS) when compared to most African countries” [3].

“Antenatal care, safe delivery practices, and postnatal care are among the most effective health interventions for preventing maternal morbidity and mortality particularly in places where the general health status of women is poor due to limited access to health facilities and deep-rooted poverty” [2,4-6].

In Ethiopia, more women gave birth at a facility than ever before, but its institutional birth rate (26%), 1<sup>st</sup> (62%) and 4<sup>th</sup> (32%) antenatal care coverage and postnatal care (PNC) from 2016 EDHS report ( 17%) are among the lowest in the world [3,7]. “Despite Ethiopia’s effort to construct and equip health facilities with staff and equipment, and strategies like a user-fee exemption for delivery and associated care during ANC have been in place to enhance

access, still the use of health facilities for maternal health services still very low” [8,9].

In Ethiopia, the high maternal and neonatal deaths, low antenatal care, low postnatal care, and institutional deliveries [3,10-12] can be improved if all get access to health facilities [13]. “These life-saving services utilization will prevent 50% to 70% of maternal deaths, 10% to 15% neonatal mortality, and substantially reduce the number of women living with a sequel of obstetric complications” [14]. “Therefore, this study is important as essential obstetric services were poorly documented and little was known about the coverage, quality, and utilization of maternal and newborn health services in Ethiopia, particularly in this part of the country” [15].

## 2. METHODS AND MATERIALS

### 2.1 Study Area and Period

The study was conducted in selected 3 sub-cities of Nekemte town and 7 rural Kebeles of Guto Gida district which are found in Eastern Wollega, Oromia Regional State from March 30, 2019, to April 30, 2019. Nekemte town is located 331Kms from Addis Ababa, the capital city of the country. Nekemte town has a total population of 122,262. Guto Gida district has a total population of 114,886. Nekemte town has 2 public hospitals, 2 health centers, and 2 private medium clinics while the Guto Gida district has 3 health centers and 1 medium clinic which provides essential obstetric care.

### 2.2 Study Design

A community-based cross-sectional study was conducted.

## **2.3 Study Population**

Postpartum women aged 15 to 49 years who gave birth in the last 6 months and who lived in Nekemte town and Guto Gida district for at least six months. Mothers who were absent, seriously sick, and not able to respond to the questionnaire were excluded from the study.

## **2.4 Sample Size Determination**

The sample size was calculated by using a single-population proportion formula based on the following assumption. Prevalence of antenatal care from EDHS, 2016 to be 62% ( $P = 0.62$ ) [3], design effect 1.5, and considering 95% confidence interval, and margin of error to be 5% ( $d = 0.05$ ) and 10% non-response rate. The sample size was therefore calculated to be 614.

## **2.5 Sampling Procedure**

A multistage sampling technique was used in this research. We listed all the 'Ganda' in Nekemte town and Guto Gida district. Then, three 'Ganda' from Nekemte town and seven 'Ganda' from Guto Gida district were selected by lottery method. After that, the 'Ganda' were further stratified by predetermined zones to ensure representativeness of the study population. From these zones, one zone was randomly selected. Then, a list of households (HHs) in the selected zones was obtained from the 'Ganda'. Health extension workers of the respective 'Ganda' were contacted to identify the HHs where the target study participants were found. Finally, the required number of participants were interviewed from randomly selected households.

## **2.6 Data Collection**

A pre-tested structured questionnaire was developed after reviewing comparable relevant literature. The questionnaire was originally prepared in English and was translated into regional working language, Afaan Oromo, by experts. The Afaan Oromo version was then translated back to the English language to check its accuracy. Ten female nurses were recruited and trained on the data collection procedure. All completed questionnaires were reviewed by the principal investigators.

## **2.7 Data Quality Management**

All collected data were checked for completeness, accuracy, and consistency by the principal investigator every day. Close

supervision and technical supports were given by the principal investigator. 5% of the sample for pretests before data collection was conducted in other sub-city which was not included in the study for its correctives.

## **2.8 Data Analysis and Processing**

After data collection was completed, it was entered into Epi-data version 7.1.4 and exported to SPSS software version 20. It was checked for its completeness, cleaned, and analyzed accordingly. Tables and graphs were used to describe some variables. 95% confidence intervals and a p-value of  $<0.05$  were considered to be statistically significant.

## **3. RESULTS**

### **3.1 The SOCIO-demographic Factor of Study Participants**

A total of 600 participants aged 15 to 49 years who gave birth in the past 6 months were included in the study making a response rate of 95.5%. Most of the participants' age group were from 25 to 30 years 143(47.7%) in rural and 148(49.3%) in urban with a mean age of 27 years. The majority of the participants were protestant religious followers with 152(50.7%) in rural and 124(41, 3%) in urban respectively. The greater proportion of participants were married (264(88%) vs. 265(88.3%)) and housewives (191(63.7%) vs. 154(51.3)) in rural and urban respectively. The majority of participants attended formal education (Table 1).

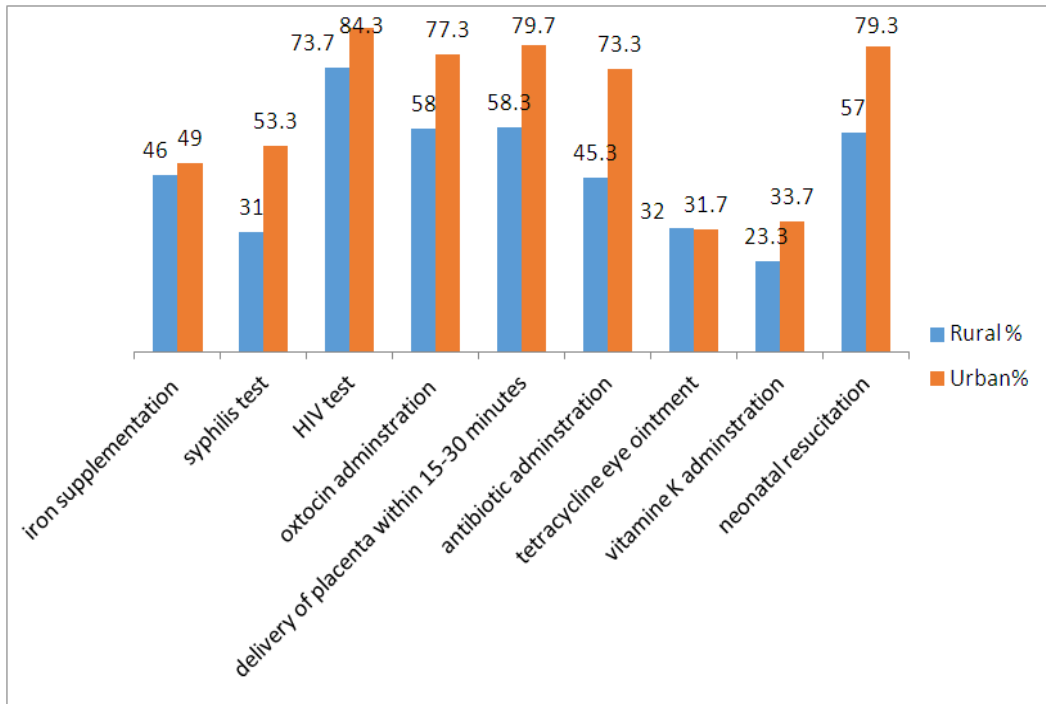
### **3.2 Utilization of Maternal Health Services by Study Participants**

The majority of participants, 187(62.3 %) in rural and 169(56.4) in urban, were from para 2 to 4. ANC coverage in health facilities was 122(40.7%) in rural and 135(45%) urban. The majority of those participants who attended ANC were motivated by themselves (42% vs. 43%) in rural and urban respectively. Participants who did not visit for ANC were due to personal factors like ignorance, fear, and distance from health facilities and not know the importance of ANC and institutional delivery.

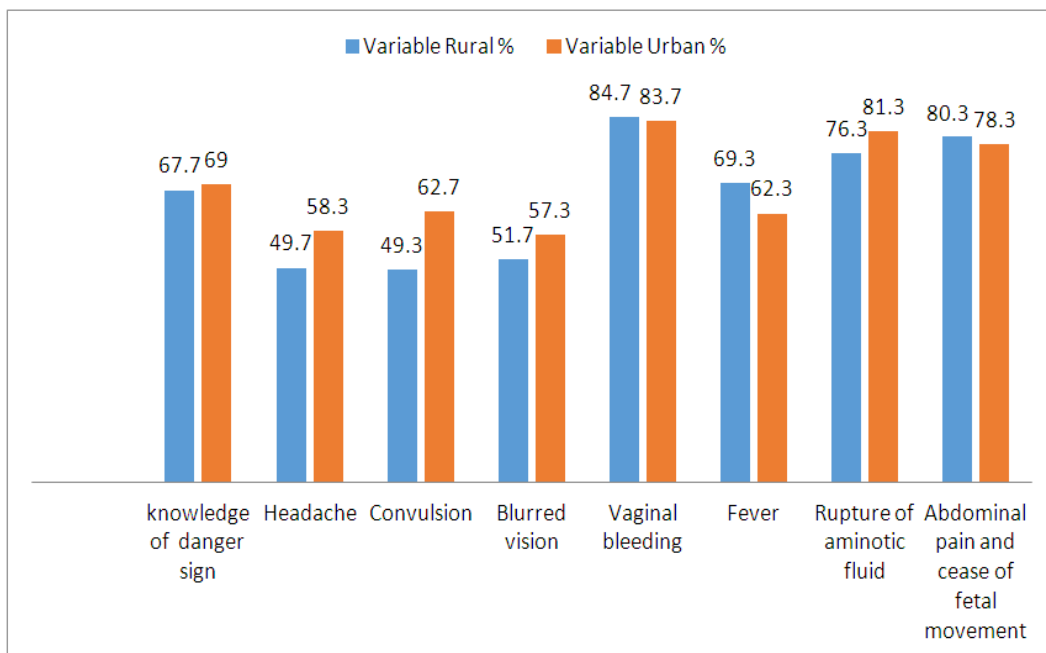
Of the total participants, 183 (61%) in rural and 245(81.7%) urban gave birth in health facilities. Thirty-nine percent of attendants in rural and 18.2% of attendants in urban gave birth at home. Postnatal care visit coverage

was 68(22.7%) in rural and 54(18%) urban. Fee waiver service was given for 33.7% and 40.3% of participants in rural and urban respectively.

Regarding birth preparedness, 75.7% of rural and 82.7% of urban participants had a birth preparedness plan (Table 2).



**Fig. 1. Program-Based Maternal Health services utilization in East Wollega, Western Ethiopia, 2019**



**Fig. 2. Knowledge about Danger Signs of Pregnancy Among Study Participants in East Wollega, Western Ethiopia, 2019**

**Table 1. Socio-demographic factors of study participants in the utilization of maternal health services in East Wollega, Western Ethiopia, 2019**

<b>Variable</b>	<b>Category</b>	<b>Rural Frequency Percentage</b>		<b>Urban Frequency Percentage</b>	
<b>Age</b>	15-19 years	18	6	14	4.7
	20-24 years	71	23.7	81	27
	25-30 years	143	47.7	148	49.3
	> 30 years	68	22.7	57	19
<b>Religion</b>	Orthodox	89	29.7	105	35
	Muslim	56	18.7	69	23
	Catholic	3	1	2	0.7
	Protestant	152	50.7	124	41.3
<b>Marital status</b>	Married	264	88	265	88.3
	Not Married	19	6.3	19	6.3
	Widowed	15	5	10	3.3
	Divorced	2	0.7	6	2
<b>Mother education</b>	Cannot read and write	116	38.7	6	2
	Grade 1-4	113	37.7	41	13.7
	Grade 5-8	46	15.3	61	20.3
	Grade 9-10	24	8	90	30
	Grade 11 & above	1	0.3	102	34
<b>Monthly income</b>	<18 USD	23	7.7	18	6
	18-36 USD	36	12	46	15.3
	>36 USD	241	80.3	236	78.7

USD= United States Dollar

**Table 2. Utilization of Maternal Health Services Among Study Participants in East Wollega, Western Ethiopia, 2019**

<b>Variable</b>	<b>Category</b>	<b>Rural Frequency Percentage</b>		<b>Urban Frequency Percentage</b>	
<b>Parity</b>	Para 1	103	34.3	125	41.6
	Para 2-4	187	62.3	169	56.4
	>= 5	10	3.3	6	2
<b>At least one ANC visit</b>	No	178	59.3	155	55
	Yes	122	40.7	145	45
<b>Place of delivery</b>	Hospital	41	13.7	108	36
	Health Center	141	47	96	32
	Private clinic	1	0.3	41	13.7
	Home	117	39	55	18.3
<b>Fee waiver service</b>	No	199	66.3	179	59.7
	Yes	101	33.7	121	40.3
<b>PNC</b>	No	232	77.3	246	82
	Yes	68	22.7	54	18
<b>Counseling during ANC</b>	No	103	34.3	61	20.3
	Yes	197	65.7	239	79.7
<b>Birth preparedness</b>	No	73	24.3	52	17.3
	Yes	227	75.7	248	82.7

*ANC=Antenatal care; VD=vaginal delivery; CSR=cesarean delivery; ID=instrumental delivery; PNC=postnatal care*

**Table 3. The Satisfaction of Study Participants in the Utilization of Maternal Health Services in East Wollega, Western Ethiopia, 2019**

Variables	Category	Rural Frequency	Percentage	Urban Frequency	Percentage
Getting compassionate, respectful, and caring professional	Yes	158	52.7	159	53
	No	142	47.3	141	47
Satisfaction to rooms(examination, delivery)	Dissatisfied	89	29.6	125	41.7
	Neutral	93	31	110	36.7
	Satisfied	118	39.4	65	21.7
Satisfaction to supplies( drug and other medical supplies)	Dissatisfied	97	32.3	138	46
	Neutral	123	41	124	41.3
	Satisfied	80	26.7	38	12.7
Satisfaction to care, provider	Dissatisfied	67	22.4	126	42
	Neutral	107	35.7	120	40
	Satisfied	126	42	54	18

**Table 4. Factors Associated with the Utilization of Maternal Health Services in East Wollega, Western Ethiopia, 2019**

Variable	Service utilization		COR	AOR
	No (%)	Yes (%)		
<b>Presence of danger signs ( Rural)</b>				
No	54(55.7)	43(44.3)	1.00	1.00
Yes	63(31.0)	140(69.0)	2.791(1.69,4.59)	2.02(1.04,3.95)
<b>Counseling during ANC (Rural)</b>				
No	58(56.3)	45(43.7)	1.00	1.00
Yes	59(29.9)	138(70.1)	0.33(0.20,0.54)	2.45(1.21,4.94)
<b>Counseling during ANC ( Urban)</b>				
No	28(45.9)	33(54.1)	1.00	1.00
Yes	29(12.1)	210(87.9)	6.14(3.25,11.60)	5.07(1.23,20.82)
<b>Presence of danger signs (Urban)</b>				
No	47(50.5)	46(49.5)	1.00	1.00
Yes	10(4.8)	197(95.2)	20.12(9.46,42.79)	7.85(2.02,30.57)

### 3.3 Program Based Maternal Health Service Utilization

During pregnancy, delivery, and after delivery periods there are essential program services recommended for mothers. In this study, iron was supplied for 138(46%) and 147(49%) participants in rural and urban respectively. The syphilis test was done for 93(31%) and 160(53.3%) of participants in rural and urban respectively. HIV test was done for 221(73.7%) and 253(84.3%) participants in rural and urban respectively. More than half of the participants in the study area were given a tetanus toxin vaccine during pregnancy. Tetracycline eye ointment was supplied for only 32% and 31.7% of neonates in rural and urban respectively. Vitamin K was administered for 23.3% of neonates in rural and 33.7% of neonates in urban. Delivery of the placenta within 15-30 minutes was done for 175(58.3) participants in rural and 239(79.7) in urban (Fig. 1).

### 3.4 Knowledge of Study Participants about Danger Signs of Pregnancy

In this study, 203(67.7%) and 207(69%) of participants from rural and urban respectively knew danger signs of pregnancy. Knowledge on headache (50.3% vs.37.3%) convulsion (50.7% vs. 37.3%) and blurring of vision (51.7% vs.57.3%) was low when compared to knowledge on vaginal bleeding (84% vs.85.3%), rupture of fetal membranes (76.3% vs.81.3%) and abdominal pain and cessation of fetal movements (80.3% vs. 78.3%) both in rural and urban areas (Fig. 2).

In this study, more than half of the study participants reported that they got compassionate, respectful, and caring health professionals. Satisfaction to service rooms (39.4% vs.21.7%), care providers (42% vs.18%), and supplies (26.7% vs.12.7%) were generally low both in rural and urban areas respectively (Table 3).

### 3.5 Associated Factors with the Utilization of Maternal Health Services

In bivariate analysis, utilization of maternal health services was significantly associated with variables like fee waiver service, counseling during ANC, satisfaction to service rooms, satisfaction to care providers, and presence of

danger signs of pregnancy. After adjusting for confounding factors in the multivariate analysis, factors that were significantly associated with utilization of maternal health service were the presence of danger signs of pregnancy and counseling during ANC.

Participants from rural areas who were having the danger signs were twice more likely to use maternal health services than those with no danger signs [AOR=2.02; 95% CI: 1.04, 3.95]. Similarly, participants from the urban area who were having the danger signs were about 8 times more likely to use maternal health services than those with no danger signs [AOR=7.85; 95% CI: 2.02, 30.57]. Participants from a rural area who had counseling during ANC were twice more likely to use maternal health services than those with no counseling [AOR=2.45; 95% CI: 1.21, 4.94]. Participants from the urban area who had counseling during ANC were five times more likely to use maternal health services than those with no counseling [AOR=5.07; 95% CI: 1.23, 20.82] (Table 4).

## 4. DISCUSSION

The study was conducted in the East Wollega zone to assess the utilization of maternal health services. One of the key areas assessed was the coverage of antenatal care. Its coverage was low when compared to the 2016 Ethiopian Demographic Health Service (62%) [3], studies conducted in Tigray (54%) [16], and Assela (84.2%) [17]. This could be due to personal factors like ignorance, fear, and distance from health facilities, and not knowing the importance of ANC.

Institutional delivery service utilization is one of the keys and proven interventions to reduce maternal and newborn deaths. This study showed that institutional delivery (61% in rural and 81.7% in urban) was higher than national coverage (26%) [1] and the study conducted in rural Nepal (46%) [12]. The difference could be explained by the implementation of different interventions in study areas after the national goal was set. But it is lower than finding from the study conducted at Bahir Dar (78.8%) [8], Debre Birhan, Ethiopia (80.2%) [18], and Addis Ababa, Ethiopia (82.2%) [19]. "This might be explained by the fact that the majority of study participants in this study were from rural areas when compared to the above studies. This low level can be improved by increasing the quality of antenatal care" [20].



“Prompt postnatal care is important for treating complications that arise from delivery and providing the mother with important information on caring for herself and her baby” [3]. It prevents most cases of maternal mortalities [21] In this study, postnatal care is comparable to the 2016 EDHS report (17%) [3] but by far lower than the national target (80%) [1]. This low coverage might be explained by low ANC visits and institutional delivery. Therefore, responsible stakeholders in the study areas should work in collaboration to show improvement in postnatal care.

Program-based service provision during pregnancy, delivery, and after delivery is important to prevent mothers and newborns from morbidities and mortalities. In this study, iron supplementation, tetanus toxoid vaccine, laboratory tests, and basic newborn cares were lower than findings from the 2016 EDHS report [3] and the study conducted in southern Ethiopia [7]. This might be explained by financial constraints, supply shortage, low fee waiver services, and limited engagement of stakeholders.

In this study, participant satisfaction with service areas, supplies, and providers was low when compared to other studies in Asella [17] and Jimma [22]. This might be explained by the high patient load and limited alternatives in the study areas.

In this study, the presence of danger signs during pregnancy is associated with the utilization of maternal health services. This is similar to a study conducted in India [23]. Therefore, identifying these signs during pregnancy is so crucial. Counseling about maternal health services during antenatal care is also associated with its utilization. Systematic review and meta-analysis in Ethiopia also showed this [24].

## **5. CONCLUSION**

Coverage of antenatal care, institutional delivery, and postnatal care in this study was low. The utilization of program services during pregnancy, delivery, and postnatal periods was also low. Therefore, governmental and non-governmental organizations should give due attention to avert possible complications that can arise from this low coverage and utilization.

## **CONSENT AND ETHICAL APPROVAL**

Ethical clearance was obtained from the Research Ethics Review Committee (RERC) of Wollega University. Nekemte town and Guto Gida health office were informed of the study's aims and objectives and permission was obtained. Following an explanation of the purpose and objectives of the study, written informed consent was obtained from each study participant. For under 18 years, informed consent was obtained from parents. The participants were assured that all information was used only for the study. Confidentiality was assured by not recording the participant's name on the questionnaire. All methods were carried out in accordance with relevant guidelines and regulations.

## **AVAILABILITY OF DATA AND MATERIALS**

The data sets are available from the corresponding author on a reasonable request.

## **FUNDING**

The study has been funded by Wollega University who did not influence study design, data collection, analysis, and interpretation of data, and in writing the manuscript.

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## **COMPETING INTERESTS**

Authors have declared that no competing interests exist.

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