Original Research Article

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

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.

Method: 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

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, 5,6].

In Ethiopia, more women gave birth at a facility than ever before, but its institutional birth rate (26%), 1st (62%) and 4th (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 [3,10,11, 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].

METHODS AND MATERIALS

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.

Study design: A community-based cross-sectional study was conducted.

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.

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.

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.

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.

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.

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.

RESULTS

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**).

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**).

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 (**Figure 1**).

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 (**Figure 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**).

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).**

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 metanalysis in Ethiopia also showed this[24].

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.

List of 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,

DECLARATIONS

Ethical Considerations

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.

Consent to publish: Not applicable

Availability of data and materials

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

References

1. Accorsi S, Bilal NK, Farese P, Racalbuto V. Countdown to 2015: comparing progress towards the achievement of the health Millennium Development Goals in Ethiopia and

other sub-Saharan African countries. *Trans R Soc Trop Med Hyg*. 2010; 104(5):336-342. Doi.10.1016/j.trstmh.2009.12.009

2. World Health Organization, UNICEF, UNFPA, and The World Bank. Trends in maternal mortality: 1990 to 2010. Geneva, World Health Organization, 2010.
3. *Ethiopia demographic and health survey(EDHS), Addis Ababa, Ethiopia. 2016*
4. Agha, S., Carton, T.W. Determinants of institutional delivery in rural Jhang, Pakistan. *Int J Equity Health* **10,** 31 (2011). https://doi.org/10.1186/1475-9276-10-31
5. World Health Organization. The Partnership for Maternal, Newborn, and Child Health. Opportunities for Africa's newborns: Practical data, policy, and programmatic support for newborn care in Africa, 2006.
6. Adam T, Lim SS, Mehta S, et al. Cost-effectiveness analysis of strategies for maternal and neonatal health in developing countries. *BMJ*. 2005;331(7525):1107. Doi.10.1136/bmj.331.7525.1107
7. Windsma M, Vermeiden T, Braat F, *et al.*Emergency obstetric care provision in Southern Ethiopia: a facility-based survey. *BMJ Open* 2017;**7:**e018459. doi: 10.1136/bmjopen-2017-018459
8. Abeje, G., Azage, M. & Setegn, T. Factors associated with Institutional delivery service utilization among mothers in Bahir Dar City administration, Amhara region: a community based cross-sectional study. *Reprod Health* **11,** 22 (2014). https://doi.org/10.1186/1742-4755-11-22

9. Amano, A., Gebeyehu, A. & Birhanu, Z. Institutional delivery service utilization in Munisa Woreda, South East Ethiopia: a community-based cross-sectional study. *BMC Pregnancy Childbirth* **12,** 105 (2012). https://doi.org/10.1186/1471-2393-12-105
10. Abosse Z, Woldie M, Ololo S. Factors influencing antenatal care service utilization in Hadiya zone. *Ethiop J Health Sci*. 2010;20(2):75-82. Doi.10.4314/ejhs.v20i2.69432
11. Dhaher, E., Mikolajczyk, R.T., Maxwell, A.E. *et al.* Factors associated with lack of postnatal care among Palestinian women: A cross-sectional study of three clinics in the West Bank. *BMC Pregnancy Childbirth* **8,** 26 (2008). https://doi.org/10.1186/1471-2393-8-26
12. Osrin D, Tumbahangphe KM, Shrestha D, et al. Cross-sectional, community-based study of care of newborn infants in Nepal. *BMJ*. 2002;325(7372):1063. Doi.0.1136/bmj.325.7372.1063
13. Mehari, Asmeret Moges. Levels and Determinants of Use of Institutional Delivery Care Services among Women of Childbearing Age in Ethiopia: Analysis of EDHS 2000 and 2005 Data. DHS Working Papers No. 83. Calverton, Maryland, USA: ICF International,2013.
14. Freedman LP, Graham WJ, Brazier E, et al. Practical lessons from global safe motherhood initiatives: time for a new focus on implementation. *Lancet*. 2007;370(9595):1383-1391. doi:10.1016/S0140-6736(07)61581-5
15. Keyes EB, Haile-Mariam A, Belayneh NT, et al. Ethiopia's assessment of emergency obstetric and newborn care: setting the gold standard for national facility-based assessments. *Int J Gynaecol Obstet*. 2011;115(1):94-100. doi:10.1016/j.ijgo.2011.07.009

16. Tsegay, Y., Gebrehiwot, T., Goicolea, I. *et al.* Determinants of antenatal and delivery care utilization in Tigray region, Ethiopia: a cross-sectional study. *Int J Equity Health* **12,** 30 (2013). https://doi.org/10.1186/1475-9276-12-30
17. Amdemichael R, Tafa M, Fekadu H. Maternal Satisfaction with the Delivery Services in AsselaHospital, Arsi Zone, Oromia Region. Gynecol Obstet (Sunnyvale) 2014;4: 257. doi:10.4172/2161-0932.1000257
18. UNFPA. Trends in maternal health in Ethiopia: challenges in achieving the MDG for maternal mortality: an in-depth analysis of the EDHS 2000-2011,2012.
19. Limenih A, Deyesa N, Berhane A. Assessing the Magnitude of Institutional Delivery Service Utilization and Associated Factors among Mothers in Debre Berhan, Ethiopia. J Preg Child Health2016; 3:254. doi:10.4172/2376-127X.1000254
20. Rockers, P.C., Wilson, M.L., Mbaruku, G. *et al.* Source of Antenatal Care Influences Facility Delivery in Rural Tanzania: A Population-Based Study. *Matern Child Health J* **13,** 879 (2009). https://doi.org/10.1007/s10995-008-0412-7
21. World Health Organization. Postnatal Care Guidelines, March 2015
22. Tadesse, Biniyam Haile et al. "Mothers' Satisfaction with Institutional Delivery Service in Public Health Facilities of Omo Nada District, Jimma Zone." *Clinical Medicine & Research* 6 (2017): 23.
23. Ahmad, D., Mohanty, I., Hazra, A. *et al.* The knowledge of danger signs of obstetric complications among women in rural India: evaluating an integrated microfinance and health literacy program. *BMC Pregnancy Childbirth* **21,** 79 (2021). https://doi.org/10.1186/s12884-021-03563-5

24. Geleto, A., Chojenta, C., Musa, A. *et al.* WOMEN's Knowledge of Obstetric Danger signs in Ethiopia (WOMEN's KODE):a systematic review and meta-analysis. *Syst Rev* **8,** 63 (2019). https://doi.org/10.1186/s13643-019-0979-7

Table legends

1. Table 1.Socio demographic factors of study participants in the utilization of essential obstetric care in East Wollega, Western Ethiopia, 2018
2. Table 2. Utilization of essential obstetric care by study participants in East Wollega, Western Ethiopia, 2018
3. **Table 3.** The satisfaction of study participants in the utilization of essential obstetric care in East Wollega, Western Ethiopia, 2018

Figure legends

1. Figure 1. Program based service utilization of essential obstetric care by study participants in East Wollega, Western Ethiopia, 2018
2. Figure 2. Knowledge about danger signs of pregnancy among study participants in East Wollega, Western Ethiopia, 2018

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

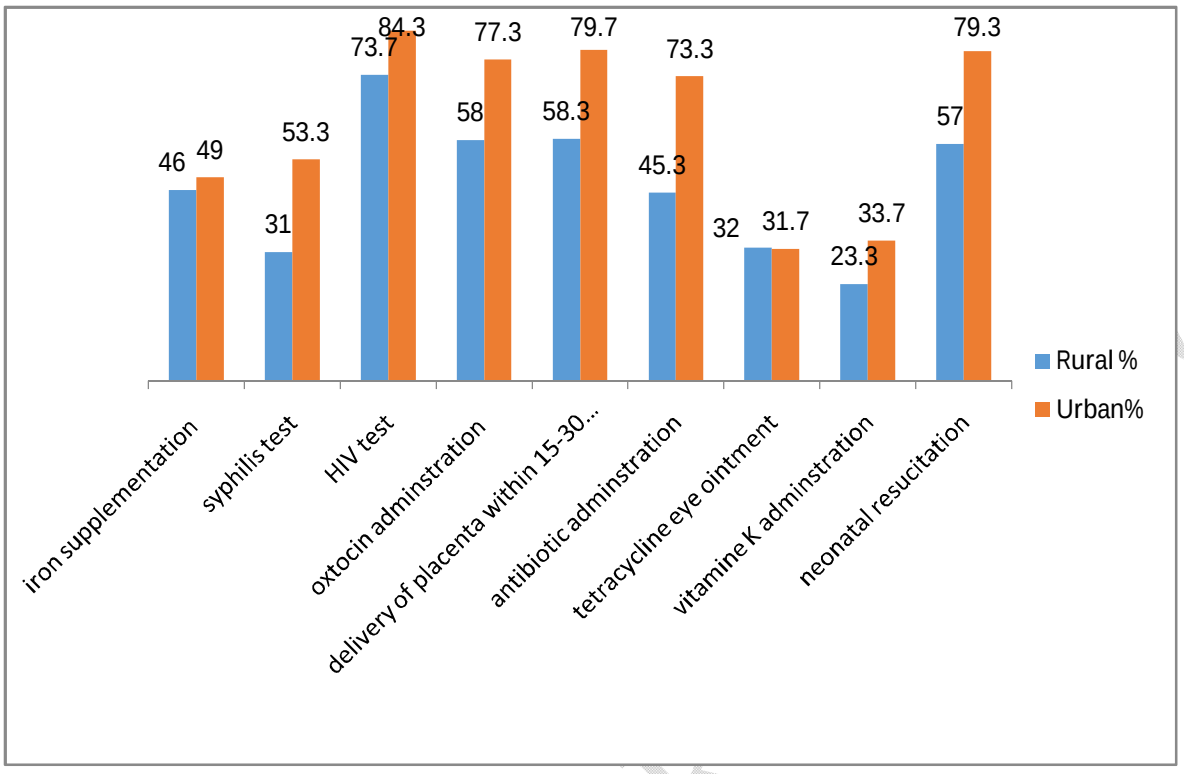

Figure 2. Knowledge About Danger Signs of Pregnancy Among Study Participants in East Wollega, Western Ethiopia, 2019

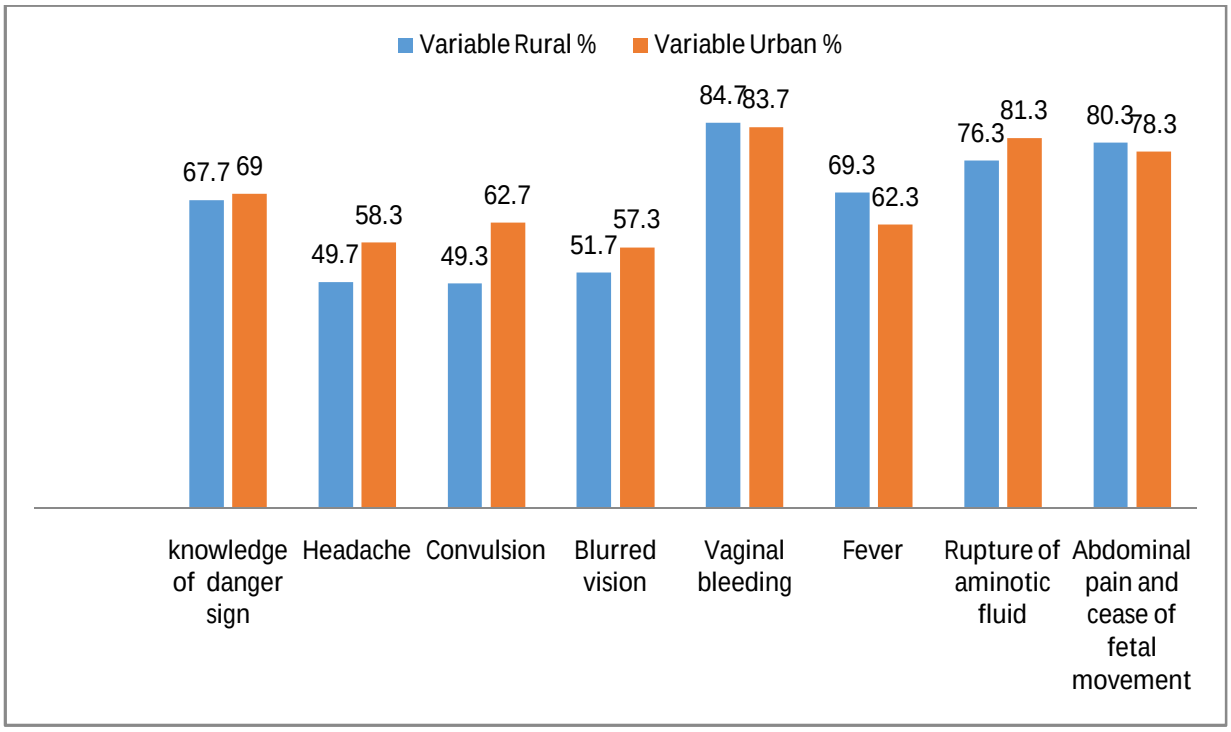

Table 1.Socio-demographic factors of study participants in the utilization of maternal health services in East Wollega, Western Ethiopia, 2019

Variable	Category	Rural		Urban	
		Frequency	Percentage	Frequency	Percentage
Age	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
Religion	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
Marital status	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
Mother education	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
Monthly income	<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

		Rural		Urban	
Variable	category	Frequency	Percentage	Frequency	Percentage
Parity	Para 1	103	34.3	125	41.6
	Para 2-4	187	62.3	169	56.4
	>= 5	10	3.3	6	2
At least one	No	178	59.3	155	55
ANC visit	Yes	122	40.7	145	45
Place of	Hospital	41	13.7	108	36
delivery	Health				
	Center	141	47	96	32
	Private				
	clinic	1	0.3	41	13.7
	Home	117	39	55	18.3
Fee waiver	No	199	66.3	179	59.7
service	Yes	101	33.7	121	40.3

PNC	No	232	77.3	246	82
	Yes	68	22.7	54	18
Counseling	No	103	34.3	61	20.3
during ANC	Yes	197	65.7	239	79.7
Birth	No	73	24.3	52	17.3
preparedness	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		Urban	
		Frequency	Percentage	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 (%)		
Presence of danger signs (Rural)				
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)
Counseling during ANC (Rural)				
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)
Counseling during ANC (Urban)				
No	28(45.9)	33(54.1)	1.00	
Yes	29(12.1)	210(87.9)	6.14(3.25,11.60)	5.07(1.23,20.82)
Presence of danger signs (Urban)				
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)