



# Assessing the Determining Factors of Place Choice at Delivery Among Women of Child Bearing Age in NunuKumba Woreda, East Wollega Zone, Western Ethiopia

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**Abstract:** Only 50% of women and no more than 40 percent of births in the developing world are attended by a skilled healthcare provider. Worldwide, lack of skilled attendants at birth accounts for two million preventable maternal deaths, stillbirths and newborn deaths each year. Unavailability of the services, inadequate number of skilled personnel, geographical inaccessibility and poor quality of care, financial constraints, and preference for home delivery were barriers to access to skilled care by women especially in developing countries. Appropriate delivery care is crucial for both maternal and prenatal health and increasing skilled attendance at birth is a central goal of the safe motherhood and child survival movements and is an important indicator in monitoring progress towards Millennium Development Goal 5 (five). This study assessed the magnitude and factors affecting place of delivery among women of child bearing age in Nunu Kumba Woreda, Oromia region, Western Ethiopia. Community based cross sectional quantitative household survey was employed. A pre-tested structured questionnaire was used. The response rate for this study was 100%. Those mothers who didn't attended antenatal care for their last pregnancy were 7.8 times more likely in home birth as compared to antenatal care attendants. Mothers whose husband's educated were less likely to choose home as delivery place AOR 95%CI (0.232, 0.083-0.644). Age at first marriage, antenatal care attendance, number of visits for antenatal care, planning of pregnancy, choice of husband to place of delivery and his educational status, and mode of transport used to reach health facility were the significant predictors of choice of delivery place. Therefore, women and partner education, inter sectorial collaboration, availing youth friendly services at all health units and equipping health posts are recommended.

**Keywords:** Nunu Kumba, Place of Delivery, Child Bearing Age Women, East Wollega

## 1. Introduction

Maternal mortality-the death of women during pregnancy, childbirth, or in the 42 days after termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes-remains a major challenge to health systems worldwide [1, 2]. The 1994 International Conference on Population and Development strengthened international commitment to

reproductive health. The focus on maternal mortality was sharpened when reduction in maternal mortality became one of eight goals for development in the Millennium Declaration (Millennium development Goal 5) in which the target is to reduce the maternal mortality ratio by three-quarters from 1990 to 2015 [1].

Globally, there were an estimated 287,000 maternal deaths in 2010, providing a Maternal Mortality Rate of 210 per 100,000 live births according to WHO, UNICEF, UNFPA and the World Bank estimates [2]. Developing countries account for 99% (284,000) of the global maternal deaths, the majority

of which are in sub-Saharan Africa (SSA) (162,000) and Southern Asia (83,000). These two regions accounted for 85% of global burden; with sub-Saharan Africa alone accounting for 56%. SSA had the highest MMR at 500 maternal deaths per 100,000 live births, while Eastern Asia had the lowest among MDG developing regions at 37 maternal deaths per 100,000 live births [2]. Worldwide, 80% of maternal deaths are due to a few direct obstetric complications-sepsis, hemorrhage, eclampsia, obstructed labour and unsafe abortion; most could be prevented or managed if the woman had access to a skilled attendant with the necessary back-up and support. The remaining deaths, those caused by underlying conditions exacerbated by pregnancy, for example severe anemia, tuberculosis (TB), malaria and HIV/ AIDS, also require the assistance of a skilled health care provider during the course of pregnancy, birth and the immediate postnatal period for appropriate management and treatment [3]. In Africa hemorrhage account for 34% of maternal mortality and the proportion of deaths due to post-partum hemorrhage (PPH) that occurred in facilities is most likely due to the fact that over 90% of births take place at home, and women with PPH may not be arriving at a health facility on time [1, 4]. In Ethiopia, maternal mortality level is among the highest in the world accounting 676 per 100,000 live births according to 2011 Ethiopian Demographic Health Survey (EDHS), which is likely linked both to extremely low utilization of skilled birth attendants, low facility delivery and lower use of emergency obstetric care [5].

More lives could be saved if all women had access to voluntary family planning, ensuring that births are wanted, have skilled attendance at all births and utilize emergency obstetric care when necessary. It is estimated that no more than 40% of births in the developing world are attended by a skilled healthcare provider, a midwife, or other formally trained healthcare provider with midwifery skills and it can be as low as 10 per cent in low-income countries. In contrast, in high-income countries and in many countries with transitional economies, a skilled birth attendant will assist 90% or more of all births [6].

Appropriate delivery care is crucial for both maternal and prenatal health and increasing skilled attendance at birth is a central goal of the safe motherhood and child survival movements [7]. A lack of skilled attendants at birth accounts for two million preventable maternal deaths, still births and newborn deaths each year. The global shortage of midwives is especially severe: an estimated 700,000 new midwives and other trained providers are needed in order to provide skilled childbirth care to all women who need it. In Africa alone, an additional 1.5 million health workers are needed, nearly doubling the current workforce of 1.6 million, according to the Global Health Workforce Alliance [8].

UNFPA affirms that it is the basic right of every woman and baby to have the best available care to enable them to survive pregnancy and childbirth in good health [6]. Saving mothers' lives is widely recognized as an imperative for social and economic development, as well as a human rights

imperative. Skilled attendance at delivery is an important indicator in monitoring progress towards Millennium Development Goal 5 to reduce the maternal mortality. In addition to professional attention, it is important that mothers deliver their babies in an appropriate setting, where lifesaving equipment and hygienic conditions can also help reduce the risk of complications that may cause death or illness to mother and child [7].

In Ethiopia only 34% of pregnant mothers received antenatal care from a skilled provider, and only 10% of deliveries are conducted in public facilities and nine women in every ten deliver at home. The majority (58%) of these are assisted by relatives, 28% by TBAs and 5% without any assistant at all. In Oromia region only 31.3% received Antenatal care of which only 8% received skilled care from skilled care attendants according to 2011 EDHS [5]. But Health Management Information System (HMIS) report shows variation in skilled care being 16.6% nationally and 17.7% in Oromia Region [9]. Therefore, assessing the factors affecting place of delivery in the study area is very important to improve skilled care services thereby reducing maternal and infant deaths.

Most obstetric complications occur around the time of delivery and cannot be predicted. Therefore, skilled attendance at delivery is advocated as the "single most important factor in preventing maternal deaths" and the "proportion of births attended by skilled health personnel" is one of the indicators for Millennium Development Goal 5 [10]. Several factors have been identified as barriers to access to skilled care by women especially in developing countries. These include unavailability of the services, inadequate number of skilled personnel, geographical inaccessibility and poor quality of care, financial constraints, no perceived need for such services, preference for home delivery because it is much less expensive [11, 12]. Promoting delivery in health facilities is a core strategy to reduce maternal mortality in Ethiopia.

Although it is known that attendance to a pregnant woman by skilled birth attendant during childbirth significantly decreases maternal morbidity and mortality, there is still low utilization of skilled attendance for childbirth in Ethiopia accounting only 10% where as 8% in Oromia Region [5]. Nunu Kumba Woreda is located in East Wollega Administrative Zone, found in Oromia Region. Therefore, this study aimed to assess factors affecting place of delivery on demand side leading to low utilization of skilled care service among mothers who gave birth in the last 24 months in Nunu Kumba District, Oromia Region, Ethiopia [4]. In addition, since there is no previous study that has been done in the study Woreda it is therefore important to identify the factors that is leading to either home or health institutional delivery and this will serve as a reference for the relevant stakeholders in the planning and implementation of intervention activities to improve the delivery service utilization of pregnant women in Nunu Kumba Woreda.

## 2. Methods and Materials

### 2.1. Study Area and Period

The study was conducted in Nunu Kumba Woreda, East Wollega Zone, Oromia Region, which is 400 KM from Addis Ababa, Capital city of Ethiopia and 68 KM from Nekemte the capital city of East Wollega Zone. Currently the total population of Nunu Kumba Woreda is 76,432 (projected from 2007 census) of which 38,980 (51%) are female population. Of these 18.4% (14,063) is expected to be women of child bearing age (15-49) of which 3.37% (2576) are expected to be pregnant. There are four health centers (1 type A and 3 type B), 21 health posts, 1 Drug vendor, 2 drug stores, 10 private clinics and 1 medium clinic found in the Woreda. Concerning the staffs of the Woreda in 2012 there are 2 health officers, 5 BSc Nurses, 8 midwifery nurses (1 BSc and 7 Dip), 3 public nurses, 25 clinical nurses. The Woreda has ambulance to refer patients to Nekemte Hospital. There are 2 urban Kebeles (the lowest administrative unit in Ethiopia) and 20 rural Kebeles. There are two high schools and one preparatory school in the Woreda. This study was conducted from November 1 to June 30, 2012.

### 2.2. Study Design

A quantitative Community based cross sectional house hold survey among women who gave birth in the last 24 months.

### 2.3. Population

#### 2.3.1. Source Population

Women of child bearing age who gave birth in the last 24 months in selected sample kebeles.

#### 2.3.2. Study Population

Sampled women of child bearing age who gave birth in the last 24 months irrespective of pregnancy outcomes, gestation or place of delivery in selected sample kebeles.

### 2.4. Variables

#### 2.4.1. Dependent Variable

Place of delivery

#### 2.4.2. Independent Variables

- 1) Socio-demographic like age, maternal education, husband education, women's autonomy, ethnicity and religions,
- 2) Economic factors like income, mother's occupation and husband's occupation
- 3) Socio-cultural factors like traditional beliefs on place of delivery.
- 4) Geographical accessibility of care like distance to facility
- 5) Information availability on place of delivery.
- 6) Health service factors like availability of the service, cost and provider attitude towards laboring mother.
- 7) Personal factors like women's perception towards

- pregnancy and child birth, satisfaction by the care given at health institution, women's previous experience
- 8) Past obstetrical profile of the mother, gravidity, parity

### 2.5. Eligibility Criteria

#### 2.5.1. Inclusion Criteria

- 1) Women who are usual residents (de jure) of study area.
- 2) Women age 15-49 years who gave birth in the last 24 months and are mentally and physically capable of being interviewed.

#### 2.5.2. Exclusion Criteria

Women who are not physically and mentally capable of being interviewed.

### 2.6. Sample Size Determination

The sample size is determined using single population proportion formula:-

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

Proportion of deliveries attended by skilled birth personnel of Oromia region is 8% [5].

Where n=sample size

Z=Reliability Coefficient with 95%confidence interval

P=Population variance available from previous data q=1-p

d=Standard error allowed=3%

If the value of p is 0.08 and the desired error chosen to be 0.03 with the reliability coefficient of 1.96% certainly (z=1.96)

$$n = (1.96)^2 \times \frac{0.08 (1 - 0.08)}{(0.03)^2} = \frac{3.84 \times (0.074)}{0.0009} = \frac{0.284}{0.0009} = 316$$

n=316 multiplying by 2 (design effect)=632+5% none respondent rate 32=664

### 2.7. Sampling Technique

Multistage sampling technique was employed. Simple Random Sampling technique was used to select the study kebele (the lowest administrative unit in Ethiopia), one urban kebele from two urban kebeles and eight rural kebeles from 20 rural kebeles will be selected based on availability of the resource (budget & time). The secondary sampling units, the households in the selected Kebeles were selected using systematic sampling procedure and by starting at random around kebele office every 11<sup>th</sup> house is interviewed. The sample size was distributed to Kebeles by probability proportion to size (PPS) formula. An interview was conducted by face to face of those who were enrolled for the study and in case there were two mothers in selected house lottery was used to select.

### 2.8. Data Collection Instrument and Procedure

The pre-tested structured questionnaire was first prepared in English and then translated to Afaan Oromo. College graduates of Nurses and Midwifery who know and speak the local language were selected and hired for data collection and

supervision. They were trained on objective of the study, method of data collection and discussed thoroughly on the tools prepared for data collection by the principal investigator. During the training days explanation was given on the purpose of the study and discuss on the tool designed for data collection, how to implement, potential problems that can arise and how to solve them. The interview technique was employed for the selected respondents in the chosen households. Explanation was given on the purpose of the study and the importance of their involvement then respondents who volunteered were interviewed face- to- face using structured and pretested questionnaires.

## 2.9. Operational Definitions

**Skilled birth attendant:-** People with midwifery skills (for example, doctors, midwives, Health Officers, v TTBA's and nurses) who have been trained to proficiency in the skills necessary to manage normal deliveries and diagnose, manage, or refer obstetric complications.

**Income:-**for rural study participant calculated in kind the crop, cattle changed in to monetary forms.

**Women's autonomy:-**Decision-making power of women on one's own choice of delivery place.

**Attitude of health staff:-** affective behavior (feelings) of health staff towards clients and relatives.

**Distance:-**is measured in walking hours from home to the nearest health facility (According to WHO standard distance more than 5KM from home to health facilities are said to be far)

## 2.10. Data Analysis

Collected quantitative data was edited, coded and entered to Epi Info computer software. Then it was transferred to SPSS for analysis. Frequencies and percentages of the responses were calculated. Associations between variables were assessed by using Odds Ratio, 95% Confidence Intervals and p-values. Multiple logistic-regressions were used to adjust for possible confounding variables.

## 2.11. Data Quality Management

The following key strategies were used for data quality control:-

- 1) All data collection tools were translated to local language and back translated to English by people who have proficiency in translation to ensure its consistency.
- 2) Training of data collectors and supervisors were made to enable them acquire basic skills necessary for data collection and supervision.
- 3) Pre-testing of data collection tool was made based on the results of pre-testing,
- 4) Necessary adjustments to the data collection tools were

made.

5) Spot check was done on the field.

6) Filled questionnaires were checked daily for completeness. In case of incomplete data collectors were re visited. At least 5% randomly selected were checked by PI (principal investigator).

## 2.12. Ethical Clearance

Ethical clearance was also obtained from the Research and Ethics Committee (REC) of the school of public health. To collect data from participants, explanation was given on the purpose of the study, the importance of their participation and true response. It is also explained that the study will have no connection with individual affairs of respondents. Confidentiality of all data collected was kept. All sample populations were encouraged to participate in the study while at the same time they were told their right not to participate.

## 2.13. Dissemination of Results

The result of this research will be disseminated freely for the community, to staff, managers of health and health related services, to researchers and donor agencies and in general to all stakeholders through regional meetings, district meetings, staff meetings, through digital library and also will be accessible in Addis Ababa University, school of public health library.

# 3. Result

## 3.1. Socio-Demographic Characteristics of Respondents

A total of 664 women of child bearing age (15-49 years) who had given birth in the preceding two years before the survey were interviewed giving response rate of 100 percent. From 664 women 301 (45.3%) aged 25-29, 137 (20.6%) were aged 20-24 years and 110 (16.6%) were 30-34 years. Six hundred fifty four (98.5%) of the respondents were currently married with mean  $\pm$  (SD) and median age at first marriage of 17.86 $\pm$ (2) and 18years respectively with the remaining 4 (0.6%) and 6 (0.9%) being separated and widowed respectively.

More than half of the respondents, 377 (56.8%) have never attended any formal education and 94 (14.2%) were able to read and write. Regarding the total household monthly income Majority, 584 (88%) earn  $\leq$ 500ETB (Ethiopian Birr) and only 4 (0.6%) earn  $>$ 1500ETB. Five hundred twenty (78.3%) of decision concerning household expenditure was made by both husband and wife whereas 110 (16.6%) was made by husband alone (Table 1).

**Table 1.** Socio-demographic characteristics of study participants on factors affecting place of delivery in NunuKumba Woreda, Western Ethiopia, 2012

Variable	Rural No (%)	Urban No (%)	Total No (%)
Maternal Age			
15-19	20 (3)	6 (0.9)	26 (3.9)
20-24	119 (17.6)	18 (3)	137 (20.6)
25-29	276 (41.5)	25 (3.8)	301 (45.3)

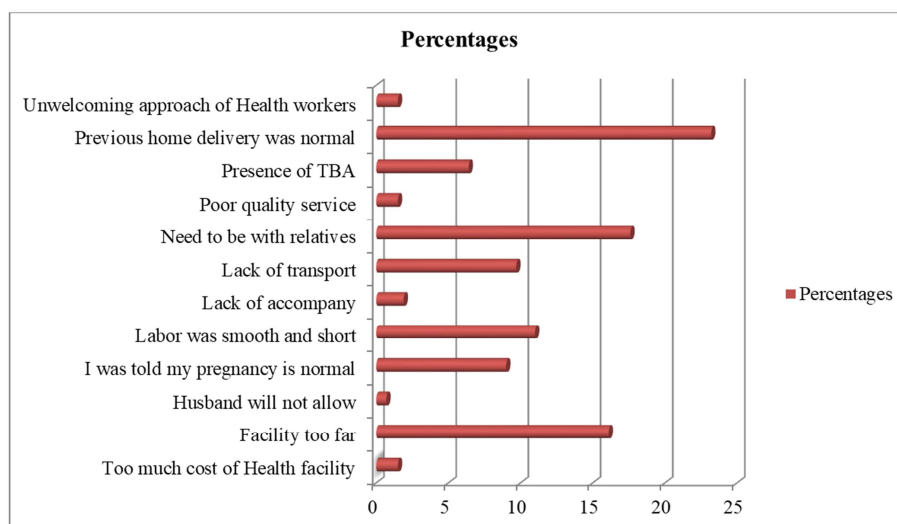
Variable	Rural No (%)	Urban No (%)	Total No (%)
30-34	98 (14.8)	12 (1.8)	110 (16.6)
35 and above	85 (12.8)	5 (0.8)	90 (13.6)
Total	598	66	664 (100%)
Marital status			
Married	590 (88.9)	64 (9.6)	654 (98.5)
Separated	4 (0.6)	0 (0)	4 (0.6)
Widowed	4 (0.6)	2 (0.3)	6 (0.9)
Total	598	66	664 (100)
Educational status			
Illiterate	360 (54.2)	17 (2.6)	377 (56.8)
Read and Write	79 (11.9)	15 (2.3)	94 (14.2)
Primary Education (1-8)	150 (22.6)	25 (3.8)	175 (26.4)
Secondary Education (9 & above)	9 (1.35)	9 (1.35)	18 (2.7)
Total	598	66	664 (100)
Religion			
Muslim	37 (5.6)	21 (3.1)	58 (8.7)
Orthodox	165 (24.9)	16 (2.4)	181 (27.3)
Protestant	396 (59.6)	29 (4.4)	425 (64.0)
Total	598	66	664 (100)
Ethnicity			
Oromo	595 (89.6)	66 (9.9)	661 (99.5)
Amhara	3 (0.5)	0 (0)	3 (0.5)
Total	598	66	664 (100)
Occupation			
Farmer	18 (2.7)	2 (0.3)	20 (3)
Government Employee	4 (0.6)	6 (0.9)	10 (1.5)
House wife	560 (84.3)	23 (3.5)	583 (87.8)
Merchant	15 (2.3)	30 (4.5)	45 (6.8)
Other*	1 (0.2)	5 (0.8)	6 (1.0)
Total	598	66	100
Husband's educational status			
Illiterate	210 (31.6)	8 (1.2)	218 (32.8)
Read and Write	132 (19.8)	7 (1.1)	139 (20.9)
Primary Education (1-8)	208 (31.3)	31 (4.7)	239 (36.0)
Secondary Education (9 & above)	48 (7.2)	20 (3)	68 (10.2)
Total	598	66	664 (100)
Husband's occupation			
Farmer	559 (84.1)	1 (0.2)	560 (84.3)
Government Employee	18 (2.7)	17 (2.6)	35 (5.3)
Merchant	12 (1.8)	40 (6)	52 (7.8)
Other**	9 (1.4)	8 (1.3)	17 (2.7)
Total	598	66	664 (100)
Income			
=<500	544 (82)	40 (6)	584 (88.0)
501-1000	42 (6.3)	20 (3)	62 (9.3)
1001-1500	10 (1.5)	4 (0.6)	14 (2.1)
>=1501	2 (0.3)	2 (0.3)	4 (0.6)
Total	598	66	664 (100)
Decision maker on expenditures			
Husband	84 (12.7)	26 (3.9)	110 (16.6)
Housewife	28 (4.2)	6 (0.9)	34 (5.1)
Both	486 (73.2)	34 (5.1)	520 (78.3)
Total	598	66	664 (100)
Distance from health facility			
<1hour	122 (18.4)	66 (9.9)	188 (28.3)
1-2hours	413 (62.2)	0 (0)	413 (62.2)
>2hours	63 (9.5)	0 (0)	63 (9.5)
Total	598	66	664 (100)
Mode of transport used			
1. On foot	438 (65.9)	59 (8.9)	497 (74.8)
2. On horse or mule back	20 (3)	0 (0)	20 (3)
3. Local stretcher	137 (20.6)	4 (0.6)	141 (21.2)
4. Vehicle	3 (0.45)	3 (0.45)	6 (0.9)
Total	598	66	664 (100)

\* Private Employee, Student

\*\*Private Employee, Daily Laborer, Wood Work

### 3.2. Reasons for Preference of Place of Delivery

As shown below about 84% of the respondent's preferred Health institution and 16% home for their delivery place. The main reason for preferring health institution is that Better service accounting 71.5% followed by Safe and cleans delivery with 69.9%. From those who preferred home delivery the main reason is previous home delivery was normal accounting 58% and Need to be with relatives and Facility too far accounting 44.4% and 40.6% relatively (Table 2 and Figure 1).



**Figure 1.** Percentages of reasons for preference of home delivery NunuKumba Woreda, East Wollega Zone, Oromia Region, June 2013.

**Table 2.** Women's preference on Place of delivery and the reasons for their preference in Nunu Kumba Woreda, East Wollega Zone, Oromia region, 2012.

Variable	Rural No (%)	Urban No (%)	Total No (%)
Choice regarding Place of delivery			
Health Institution	495 (74.6)	62 (14.7)	557 (83.9)
Home	103 (15.5)	4 (0.6)	107 (16.1)
Total	598	66	664 (100)
Reason for preferring Health Institution			
Better Service	434 (65.3)	41 (6.2)	475 (71.5)
Safe and clean delivery	408 (61.5)	56 (8.4)	464 (69.9)
Health Facility near to my home.	55 (8.3)	17 (2.5)	72 (10.8)
I was informed to deliver in Health Institution	40 (6)	4 (0.6)	44 (6.6)
Because it is my first pregnancy	54 (8.1)	15 (2.3)	69 (10.4)
Fear of Complication	116 (17.4)	13 (2)	129 (19.4)
The approach of health worker is good	41 (6.2)	2 (0.3)	43 (6.5)
Reason for preferring Home delivery			
Too much cost of Health facility	4 (0.6)	0 (0)	4 (0.6)
Facility too far	43 (6.5)	0 (0)	43 (6.5)
Husband will not allow	2 (0.3)	0 (0)	2 (0.3)
I was told my pregnancy is normal	22 (3.3)	2 (0.3)	24 (3.6)
Labor was smooth and short	26 (3.9)	3 (0.5)	29 (4.4)
Lack of accompany	5 (0.8)	0 (0)	5 (0.8)
Lack of transport	26 (3.9)	0 (0)	26 (3.9)
Need to be with relatives	47 (7.1)	0 (0)	47 (7.1)
Poor quality service	2 (0.3)	2 (0.3)	4 (0.6)
Presence of TBA (traditional birth attendants)	17 (2.6)	0 (0)	17 (2.6)
Previous home delivery was normal	59 (8.9)	3 (0.4)	62 (9.3)
Unwelcoming approach of Health workers	3 (0.5)	1 (0.1)	4 (0.6)

In the last two years preceding the survey 257 (38.7%) of mothers delivered their last child at health institution and 407 (61.3%) delivered at home. More than half (50.2%) of home delivery were conducted by neighbors followed by Mother-in-law and mother accounting 149 (22.4%) and 69 (10.4%) respectively. Among those delivered in health institution 206 (31%) of deliveries were conducted by Midwifery followed by Nurses accounting 63 (9.5%). Majority 614 (92.5%) of the

respondents prefer health institution for their next delivery and 50 (7.5%) prefer home for their next delivery.

About 621 (93.5%) of the respondents replied as having information on benefit of delivering in health institution where as 43 (6.5%) had no any information on benefit of delivering in health institution. Health workers 591 (89%) were mentioned as the most source of information and only 7 (1.1) of the respondents received traditional medication to

hasten child birth 3 (0.5%), to relief pain 1 (0.2%) and to prevent complications 2 (0.3%) (Table 3).

**Table 3.** Women's decision making, Knowledge and source of information on place of delivery in Nunu Kumba Woreda, East Wollega Zone, Oromia region, 2012.

Variable	Rural No (%)	Urban No (%)	Total No (%)
Who decides on place of your delivery?			
Just me	68 (10.2)	7 (1.1)	75 (11.3)
Husband	30 (4.5)	2 (0.3)	32 (4.8)
Both	500 (75.3)	57 (8.6)	557 (83.9)
Where is the choice of your husband to your place of delivery?			
Health Institution	484 (72.9)	59 (8.9)	543 (81.8)
Home	114 (17.1)	7 (1.1)	121 (18.2)
Where did your last delivery take place in the last two years?			
Health Institution	212 (32)	45 (6.7)	257 (38.7)
Home	386 (58.1)	21 (3.2)	407 (61.3)
Total	598	66	664 (100)
If at home who assisted you?			
Mother	67 (10.1)	2 (0.3)	69 (10.4)
Mother-in-law	136 (20.4)	13 (2)	149 (22.4)
Health Extension Workers (HEWs)	5 (0.8)	0 (0)	5 (0.8)
TTBA (trained traditional birth attendant)	8 (1.2)	0 (0)	8 (1.2)
TBA (traditional birth attendant)	25 (3.8)	0 (0)	25 (3.8)
Neighbor	320 (48.2)	13 (2)	333 (50.2)
If at health facility who assisted you?			
Health Extension Workers	10 (1.5)	0 (0)	10 (1.5)
Nurse	50 (7.5)	13 (2)	63 (9.5)
Midwifery	174 (26.2)	32 (4.8)	206 (31)
Health officer	15 (2.3)	0 (0)	15 (2.3)
I don't remember	17 (2.6)	5 (0.7)	22 (3.3)
Where will your next delivery, when you are pregnant?			
Health Institution	551 (83)	63 (9.5)	614 (92.5)
Home	47 (7.1)	3 (0.4)	50 (7.5)
Do you have any information about the benefit of delivery in health institution?			
Yes	563 (84.8)	58 (8.7)	621 (93.5)
No	35 (5.3)	8 (1.2)	43 (6.5)
If yes what is the primary source of information			
Health workers	535 (80.6)	56 (8.4)	591 (89)
Friends and Neighbors who get similar service	318 (47.8)	11 (1.7)	329 (49.5)
Media	290 (43.7)	34 (5.1)	324 (48.8)
Is there any traditional medication given to the mother during child birth at home?			
Yes	5 (0.8)	2 (0.3)	7 (1.1)
No	593 (89.3)	64 (9.6)	657 (98.9)
What is the reason for medication?			
To hasten child birth	2 (0.3)	1 (0.2)	3 (0.5)
To relief pain	0 (0)	1 (0.2)	1 (0.2)
To prevent complication of child birth	2 (0.3)	0 (0)	2 (0.3)
Are you aware of any health risks a woman might experience during pregnancy?			
Yes	551 (83)	47 (7.1)	598 (90.1)
No	47 (7.1)	19 (2.8)	66 (9.9)
Do you think giving birth at home has risks?			
Yes	540 (81.3)	57 (8.6)	597 (89.9)
No	58 (8.7)	9 (1.4)	67 (10.1)
Do you know that most complications of labour are preventable?			
Yes	550 (82.8)	57 (8.6)	607 (91.4)
No	48 (7.2)	9 (1.4)	57 (8.6)

### 3.3. Women's Past Obstetrical Characteristics

Four hundred nine (61.1%) of women were married at the age of 18 and above and about two third (66.1%) of the first pregnancy occurs below 20 years old. Four hundred nine (61.6%) of the respondents had 2-4 total pregnancy with 432 (65.1) of them having 2-4 children. Regarding Antenatal Care 559 (84.2%) attended the service and 310 (46.7%) of them had 2-4 visits (Table 4).

**Table 4.** Women are past obstetrical factors of Nunu Kumba Woreda, East Wollega Zone, Oromia region, 2012.

Variable	Rural No (%)	Urban No (%)	Total No (%)
Age at first marriage?			
<18	208 (31.3)	47 (7.1)	255 (38.4)
≥18	390 (58.7)	19 (2.9)	409 (61.6)
Age at first pregnancy?			
<20	392 (59)	47 (7.1)	439 (66.1)
≥20	206 (31)	19 (2.9)	225 (33.9)
Age at Last pregnancy?			
<30	474 (71.4)	57 (8.6)	531 (80)
≥30	124 (18.6)	9 (1.4)	133 (20)
Gravidity/total number of pregnancy			
1	89 (13.4)	19 (2.9)	108 (16.3)
2-4	371 (55.9)	38 (5.7)	409 (61.6)
≥5	138 (20.7)	9 (1.4)	147 (22.1)
Parity/total number of births			
0-1	101 (15.2)	19 (2.9)	120 (18.1)
2-4	391 (58.9)	41 (6.2)	432 (65.1)
5 & above	106 (16)	6 (0.9)	112 (16.9)
Birth Order			
1	96 (14.4)	19 (2.9)	115 (17.3)
2-4	372 (56)	38 (5.7)	410 (61.7)
5 & above	130 (19.5)	9 (1.4)	139 (20.9)
Did you attend antenatal care for your last pregnancy			
Yes	497 (74.9)	62 (9.3)	559 (84.2)
No	101 (15.2)	4 (0.6)	105 (15.8)
How many visits you have for last antenatal?			
1	195 (29.3)	3 (0.5)	198 (29.8)
2-4	283 (42.6)	27 (4.1)	310 (46.7)
≥5	19 (2.9)	32 (4.8)	51 (7.7)
Whom did you see during your last ANC visit?			
Health Extension Worker	113 (17)	2 (0.3)	115 (17.3)
Midwifery	223 (33.6)	30 (4.5)	253 (38.1)
Nurse	156 (23.5)	26 (3.9)	182 (27.4)
Midwifery and Nurse	0 (0)	2 (0.3)	2 (0.3)
Health Officer	5 (0.8)	2 (0.3)	7 (1.1)
Was the pregnancy Planned?			
Yes	496 (74.7)	64 (9.6)	560 (84.3)
No	102 (15.4)	2 (0.3)	104 (15.7)
Birth Order			
First	96 (14.4)	19 (2.9)	115 (17.3)
Second	95 (14.3)	15 (2.3)	110 (16.6)
Third	132 (19.8)	13 (2)	145 (21.8)
Fourth	145 (21.8)	10 (1.5)	155 (23.3)
Fifth & above	130 (19.5)	9 (1.4)	139 (20.9)
Have you come across any obstetric difficulties in previous delivery? (prolonged labor, hemorrhage)			
Yes	117 (17.6)	10 (1.5)	127 (19.1)
No	481 (72.5)	56 (8.4)	537 (80.9)
What specific measures were taken?			
Nothing	18 (2.7)	0 (0)	18 (2.7)
Visit Health Institution	77 (11.6)	10 (1.5)	87 (13.1)
Traditional (massage, herbs)	22 (3.3)	0 (0)	22 (3.3)

### 3.4. Attitude Towards Health Service

Almost all 656 (98.8%) of the respondents responded that there is a presence of health service facility in their area and 595 (89.6%) are satisfied with the service being provided among the users 607 (91.4%). The main reasons for not being

satisfied with the services are, unpleasant approach of health workers, the service kills time and unfair and expensive are among the mentioned ones. Concerning delivery service provider attitude 467 (70.3%) responded as good and 571 (86%) mentioned the service as free of charge (Table 5).



**Table 5.** Health service factors that affect preference of place of delivery in Nunu Kumba Woreda, East Wollega Zone, Oromia region, 2012.

Variable	Rural No (%)	Urban No (%)	Total No (%)
Is there any health service which gives delivery service in your area?			
Yes	590 (88.9)	66 (9.9)	656 (98.8)
No	8 (1.2)	0 (0)	8 (1.2)
Have you used the service?			
Yes	545 (82)	62 (9.4)	607 (91.4)
No	53 (8)	4 (0.6)	57 (8.6)
Are you satisfied with delivery services given at Health units?			
Yes	540 (81.3)	55 (8.3)	595 (89.6)
No	23 (3.5)	10 (1.5)	33 (5)
Not used the service	35 (5.3)	1 (0.1)	36 (5.4)
If No what is the reason (for those not satisfied)			
I didn't used the service	2 (0.3)	0 (0)	2 (0.3)
It kills time	6 (0.9)	1 (0.2)	7 (1.1)
Unable to perform cultural ceremonies	2 (0.3)	0 (0)	2 (0.3)
Unfair and expensive price	3 (0.5)	2 (0.3)	5 (0.8)
Unpleasant approach of health workers	9 (1.4)	8 (1.2)	17 (2.6)
Delivery service Provider attitude toward labouring women			
Poor	11 (1.7)	4 (0.6)	15 (2.3)
Satisfactory	126 (19)	16 (2.4)	142 (21.4)
Good	422 (63.5)	45 (6.8)	467 (70.3)
Payment for delivery service			
<100	30 (4.5)	1 (0.2)	31 (4.7)
>100	16 (2.4)	4 (0.6)	20 (3)
Free of charge	511 (77)	60 (9)	571 (86)

### 3.5. Bivariate and Multivariate Analysis

#### 3.5.1. Bivariate Analysis

In bivariate analysis Maternal age, Residence, Respondents Educational status, Respondents occupation, Husband Educational status, Husband's Occupation, Household monthly income, Decision maker for any household expenditure, Estimated distance to nearby health facility and mode of transport used to reach health facility showed statistical association with maternal delivery place. On the other hand, marital status, Religion, traditional medication given to the mother during child birth at home, satisfaction with delivery services given at Health units, Availability of the service in the area, decision on place of delivery, and Payment for delivery service showed no association with choice of place of delivery service (Tables 6-9).

#### 3.5.2. Multivariate Analysis

In multivariate analysis Husband's Educational Status, Mode of transportation, Age at first marriage, Antenatal Care attendance, Number of ANC visit, Planning of pregnancy and choice of husband's to maternal delivery place were significantly associated with preference of place

of delivery.

Mothers whose husband's educated were less likely to choose home as delivery place AOR 95%CI (0.232, 0.083-0.644) and respondent's those who use Horse or Mule back and vehicle as a means of transportation to the health facility were less likely to prefer health institution as a place of delivery AOR 95% CI (0.154, 0.030-0.804). Women with age at first marriage  $\geq 18$  years were 2 times as likely to give birth at home when compared with  $<18$  years old AOR 95% CI (2.07, 1.032-4.177). Those who didn't attended ANC for their last pregnancy were 7.8 times higher in home birth as compared to ANC attendants AOR 95%CI (7.811, 2.232-27.33). Women with single visit of ANC for their last pregnancy were more likely to choose home delivery than those with 5 and above visits AOR 95% CI (8.68, 4.21-17.885). Those with unplanned pregnancy were more associated in home delivery than planned pregnancy AOR 95% CI (0.220, 0.088-0.553). In case of mothers whose husband's prefer health institution for delivery, the mothers are less likely to deliver at home too AOR 95% CI (0.271, 0.077-0.953) (Table 6-9).

**Table 6.** Association of Selected socio-demographic variables with preference of place of deliver among women's of child bearing age, Nunu Kumba Woreda, Oromia Region.

Variables	No (%)	Place of delivery		Crude OR (95% CI)	Adjusted OR (95% CI)
		Home No (%)	HI No (%)		
Maternal Age					
15-19	26 (3.9)	11 (1.6)	15 (2.3)	0.385 (0.158-0.939)*	0.649 (0.081-5.177)
20-24	137 (20.6)	60 (9)	77 (11.6)	0.409 (0.236-0.710)*	0.430 (0.108-1.701)
25-29	301 (45.3)	195 (29.3)	106 (16)	0.967 (0.589-1.586)	1.074 (0.412-2.797)
30-34	110 (16.6)	82 (12.4)	28 (4.2)	1.539 (0.835-2.834)	0.715 (0.254-2.009)
35 & above	90 (13.6)	59 (8.9)	31 (4.7)	1.00	1.00
Residence					
Urban	66 (10)	21 (3.2)	45 (6.8)	1.00	1.00
Rural	598 (90)	386 (58.1)	212 (31.9)	3.902 (2.264-6.725)*	2.019 (0.295-13.790)
Marital status					
Married	654 (98.5)	399 (60.1)	255 (38.4)	1.00	1.00
Other***	10 (1.5)	8 (1.2)	2 (0.3)	2.556 (0.539-12.134)	2.932 (0.111-77.143)
Religion					
Muslim	58 (8.7)	31 (4.7)	27 (4)	0.639 (0.368-1.111)	0.424 (0.152-1.182)
Orthodox	181 (27.3)	103 (15.5)	78 (11.8)	0.735 (0.516-1.048)	1.595 (0.869-2.928)
Protestant	425 (64.0)	273 (41.1)	152 (22.9)	1.00	1.00
Respondents Educational status					
Illiterate	377 (56.8)	274 (41.3)	103 (15.5)	6.917 (2.406-19.884)*	0.444 (0.061-3.222)
Read and Write	94 (14.2)	75 (11.3)	19 (2.9)	10.2639 (3.257-32.338)*	0.730 (0.093-5.720)
Primary Education	175 (26.4)	53 (8)	122 (18.4)	1.130 (0.383-3.328)	0.197 (0.028-1.392)
(1-8)	18 (2.7)	5 (0.7)	13 (2)	1.00	1.00
Secondary Education (9 and above)					
Respondent's Occupation					
Farmer	20 (3)	9 (1.3)	11 (1.7)	2.455 (0.585-10.299)	1.581 (0.114-22.027)
House wife	583 (87.8)	374 (56.3)	209 (31.5)	5.368 (1.710-16.856)*	4.097 (0.420-39.926)
Merchant	45 (6.8)	20 (3)	25 (3.8)	2.400 (0.670-8.591)	2.941 (0.275-31.509)
Other <sup>##</sup>	16 (2.5)	4 (0.6)	12 (1.9)	1.00	1.00
Husband's educational status					
Illiterate	218 (32.8)	185 (27.8)	33 (5)	7.539 (4.110-13.830)*	1.132 (0.370-3.466)
Read and Write	139 (20.9)	107 (16.1)	32 (4.8)	4.497 (2.414-8.376)*	0.630 (0.208-1.902)
Primary Education (1-8)	239 (36.0)	86 (13)	153 (23)	0.756 (0.437-1.308)	0.232 (0.083-0.644)*
Secondary Education (9 and above)	68 (10.2)	29 (4.3)	39 (5.9)	1.00	1.00
Husband's occupation					
Farmer	560 (84.3)	373 (56.1)	187 (28.2)	1.00	1.00
Gov't Employee	35 (5.3)	7 (1.1)	28 (4.2)	0.125 (0.054-0.292)*	0.146 (0.021-1.033)
Merchant	52 (7.8)	22 (3.3)	30 (4.5)	0.368 (0.206-0.655)*	2.855 (0.525-15.521)
Other <sup>###</sup>	17 (2.7)	5 (0.8)	12 (1.9)	0.209 (0.073-0.602)*	0.318 (0.038-2.692)
House Hold monthly income.					
=<500	584 (88.0)	369 (55.6)	215 (32.4)	1.00	1.00
501-1000	62 (9.3)	32 (4.8)	30 (4.5)	0.621 (0.367-1.051)	0.569 (0.201-1.613)
1001-1500	14 (2.1)	5 (0.7)	9 (1.4)	0.324 (0.107-0.978)*	2.327 (0.238-22.783)
>=1501	4 (0.6)	1 (0.1)	3 (0.5)	0.194 (0.020-1.879)	25.44 (1.279-506.056)
Decision maker for expenditures.					
Husband	110 (16.6)	49 (7.4)	61 (9.2)	0.440 (0.290-0.667)*	0.686 (0.323-1.456)
Housewife	34 (5.1)	22 (3.3)	12 (1.8)	1.004 (0.486-2.075)	0.364 (0.060-2.203)
Both	520 (78.3)	336 (50.6)	184 (27.7)	1.00	1.00
Estimated distance from home to nearby delivery institution.					
<2hr	435 (65.5)	291 (43.8)	144 (21.7)	1.00	1.00
>=2hrs	229 (34.5)	116 (17.5)	113 (17)	0.568 (0.368-0.705)*	1.251 (0.596-2.622)
Mode of transportation					
1. On foot	497 (74.8)	322 (48.5)	175 (26.3)	1.00	1.00
2. Local stretcher	141 (21.2)	75 (11.3)	66 (9.9)	0.618 (0.423-0.902)*	0.512 (0.249-1.052)
3. Other****	26 (3.9)	10 (1.5)	16 (2.4)	0.340 (0.151-0.765)*	0.154 (0.030-0.804)*

\*\*\*\*On horse/Mule back, Vehicle \*Adjusted for all significant variables p &lt;0.05

**Table 7.** Association of Women's past obstetrical factors with preference of place of deliver among women's of child bearing age, Nunu Kumba Woreda, Oromia Region.

Variables	No (%)	Place of delivery		Crude OR (95% CI)	Adjusted OR (95% CI)
		Home No (%)	HI No (%)		
Age at first marriage?					
<18	255 (38.4)	115 (17.3)	140 (21.1)	1.00	1.00
≥18	409 (61.6)	292 (44)	117 (17.6)	3.038 (2.191-4.213)*	2.076 (1.032-4.177)*
Age at first pregnancy?					
<20	439 (66.1)	239 (36)	200 (30.1)	1.00	1.00
≥20	225 (33.9)	168 (25.3)	57 (8.6)	2.466 (1.731-3.515)*	0.755 (0.370-1.539)
Gravidity/total number of pregnancy					
1	108 (16.3)	53 (8)	55 (8.3)	0.412 (0.246-0.690)*	0.348 (0.011-11.066)
2-4	409 (61.6)	251 (37.8)	158 (23.8)	0.679 (0.453-1.018)	3.043 (0.293-31.647)
≥5	147 (22.1)	103 (15.5)	44 (6.6)	1.00	1.00
Parity/total number of births					
0-1	120 (18.1)	63 (9.5)	57 (8.6)	0.334 (0.190-0.589)*	9.413 (.379-233.568)
2-4	432 (65.1)	258 (38.9)	174 (26.2)	0.448 (0.278-0.724)*	0.586 (0.141-2.445)
5 & above	112 (16.9)	86 (13)	26 (3.9)	1.00	1.00
Did you attend antenatal care for your last pregnancy					
Yes	559 (84.2)	310 (46.7)	249 (37.5)	1.00	1.00
No	105 (15.8)	97 (14.6)	8 (1.2)	9.739 (4.647-20.413)*	7.811 (2.232-27.33)*
How many visits you had for last antenatal?					
1	198 (29.8)	122 (18.4)	76 (11.4)	10.913 (6.806-17.496)*	8.68 (4.21-17.885)*
2-4	310 (46.7)	117 (17.6)	193 (29.1)	1.00	1.00
≥5	51 (7.7)	21 (3.2)	30 (4.5)	1.155 (0.632-2.111)	2.348 (0.753-7.318)
Was the pregnancy Planned?					
Yes	560 (84.3)	354 (53.3)	206 (31)	1.00	1.00
No	104 (15.7)	53 (8)	51 (7.7)	0.605 (0.397-0.921)*	0.220 (0.088-0.553)*
Birth Order					
First	115 (17.3)	59 (8.9)	56 (8.4)	0.411 (0.263-0.739)*	0.394 (0.015-10.45)
Second	110 (16.6)	64 (9.7)	46 (6.9)	0.582 (0.344-0.985)	0.958 (0.116-7.908)
Third	145 (21.8)	95 (14.3)	50 (7.5)	0.795 (0.482-1.311)	0.821 (0.106-6.341)
Fourth	155 (23.3)	91 (13.7)	64 (9.6)	0.595 (0.366-0.966)*	0.986 (0.146-6.661)
Fifth & above	139 (20.9)	98 (14.7)	41 (6.2)	1.00	1.00
Have you come across any obstetric difficulties in previous delivery? (prolonged labor, hemorrhage)					
Yes	127 (19.1)	58 (8.7)	69 (10.4)	0.453 (0.306-0.670)*	0.955 (0.482-1.891)
No	537 (80.9)	349 (52.6)	188 (28.3)	1.00	1.00

\*Adjusted for all significant variables p &lt;0.05

**Table 8.** Association of preference, information and decision making on place of delivery among women's of child bearing age, Nunu Kumba Woreda, Oromia Region.

Variables	No (%)	Place of delivery		Crude OR (95% CI)	Adjusted OR (95% CI)
		Home No (%)	HI No (%)		
Who decides on place of your delivery?					
Just me	75 (11.3)	47 (7.1)	28 (4.2)	1.031 (0.627-1.698)	0.624 (0.190-2.051)
Husband	32 (4.8)	15 (2.2)	17 (2.6)	0.542 (0.265-1.108)	0.249 (0.055-1.120)
Both	557 (83.9)	345 (52)	212 (31.9)	1.00	1.00
Where is the choice of your husband to your place of delivery?					
Health Institution	543 (81.8)	309 (46.5)	234 (35.3)	0.310 (0.191-0.503)*	0.271 (0.077-0.953)*
Home	121 (18.2)	98 (14.7)	23 (3.5)	1.00	1.00
Do you have any information about the benefit of delivery in health institution?					
Yes	621 (93.5)	365 (55)	256 (38.5)	0.034 (0.005-0.248)*	0.408 (0.025-6.589)
No	43 (6.5)	42 (6.3)	1 (0.2)	1.00	1.00
Is there any traditional medication given to the mother during child birth at home?					
Yes	7 (1.1)	5 (0.8)	2 (0.3)	1.586 (0.305-8.235)	0.894 (0.071-11.329)
No	657 (98.9)	402 (60.5)	255 (38.4)	1.00	1.00
Are you aware of any health risks a woman might experience during pregnancy?					
Yes	598 (90.1)	355 (53.5)	243 (36.6)	1.00	1.00
No	66 (9.9)	52 (7.8)	14 (2.1)	2.542 (1.378-4.690)*	2.005 (0.401-10.012)
Do you think giving birth at home has risks?					
Yes	597 (89.9)	351 (52.9)	246 (37)	1.00	1.00
No	67 (10.1)	56 (8.4)	11 (1.7)	3.568 (1.832-6.949)*	0.783 (0.129-4.765)
Do you know that most complications of labor are preventable?					
Yes	607 (91.4)	359 (54.1)	248 (37.3)	1.00	1.00
No	57 (8.6)	48 (7.2)	9 (1.4)	3.684 (1.775-7.646)*	1.328 (0.224-7.888)

\*Adjusted for all significant variables p &lt;0.05

**Table 9.** Association between health service factors among women's of child bearing age, Nunu Kumba woreda, Oromia Region.

Variables	No (%)	Place of delivery		Crude OR (95% CI)	Adjusted OR (95% CI)
		Home No (%)	HI No (%)		
Is there any health service which gives delivery service in your area?					
Yes	656 (98.8)	400 (60.2)	256 (38.6)	1.00	1.00
No	8 (1.2)	7 (1.1)	1 (0.2)	4.480 (0.548-36.627)	0.612 (0.019-19.623)
Are you satisfied with delivery services given at Health units?					
Yes	595 (89.6)	347 (52.3)	248 (37.3)	1.00	1.00
No	33 (5)	24 (3.6)	9 (1.4)	1.906 (0.871-4.171)	2.853 (0.258-31.54)
Delivery service Provider attitude toward laboring women					
Poor	15 (2.3)	9 (1.4)	6 (0.9)	1.632 (0.552-4.827)	0.176 (0.005-6.326)
Satisfactory	142 (21.4)	68 (10.2)	74 (11.2)	1.00	1.00
Good	467 (70.3)	290 (43.7)	177 (26.6)	1.783 (1.221-2.604)*	0.879 (0.449-1.722)
Payment for delivery service					
<100	31 (4.7)	16 (2.4)	15 (2.3)	0.735 (0.357-1.517)	1.374 (0.495-3.815)
>100	20 (3)	11 (1.7)	9 (1.3)	0.843 (0.344-2.065)	1.088 (0.165-7.165)
Free of charge	571 (86)	338 (50.9)	233 (35.1)	1.00	1.00

\*Adjusted for all significant variables  $p < 0.05$ 

## 4. Discussion

This community-based study has attempted to identify factors affecting place of delivery among women's of child bearing age in East Wollega Zone, Nunu Kumba woreda, Oromia Regional State. This study showed that the proportion of institutional delivery two years prior to the survey was 38.7%, and about two third (61.3%) gave birth at home. This finding was high when compared with the EDHS 2011 which showed that the percentage of deliveries attended by skilled health personnel was 10% and HMIS report was 16.6% nationally and 17.7% in Oromia Region [5]. This might be due to the time gap that is since 2011 there might have been improvements in accessing and utilizing of the service. The result was in line with that of a study done in East Hararge Zone, Oromia Region in 2011 which indicated institutional delivery to be 36.5%(19) and that of Nchelenge district, Zambia which is 43% [13].

In this study Maternal Age, Maternal Education and Birth order were not significantly associated with place of delivery. In contrast to this study, the study done at Munesa woreda, Arsi Zone, North Gondar and Sheka Zone of Ethiopia, and Bangladesh showed that maternal age and maternal education are strong predictors of place of delivery [14-17]. This may be possibly education is likely to enhance the status of women and enable them to develop greater confidence and capacity to make decisions about their own health. Unlike this study, different studies indicated that birth order is strong predictor of place of delivery [5, 15]. Because urban women tend to have better access to health facilities and other promotional activities that are usually urban based. Unlike other studies [5, 14-16], this study did not show independent association of residence on preference of choice of place of delivery. The reason may be that the towns are small and do not have significant difference in many aspects with that of the nearby rural kebeles.

The proportion of women who received antenatal care for their recent births was 84.2%. This study is in line with the study conducted in Hadiya Zone in 2009 showing the ANC utilization coverage of 86.3% [18].

Those mothers who did not attended ANC for their last pregnancy were 7.8 times more likely to give birth at home compared to ANC attendants AOR (95% CI, 7.81 (2.23-27.3). It was in line with study conducted in Haramaya woreda, East Hararge Zone, Ethiopia in which ANC is independent predictor of choice of place of delivery [11]. Another study from rural Andhra Pradesh, India also revealed that pregnant women who had adequate prenatal care were almost twice as likely to undergo skilled institutional delivery compared with those without such care [19].

Unlike other studies [11, 17] this study pointed out that age at first marriage had strong association with place of delivery. Mothers whose age at first marriage are 18 years old or more are 2 times more likely to give birth at home when compared with those who are less than 18 years old (2.07, 1.03-4.17). Possibly those who are less than 18 years old are considered early pregnancy and are not matured enough to give birth at home and fear of complication resulting from deliveries.

Consistent with different studies mothers who had single visit were more likely to give birth at home compared to those who had 5 and above visits AOR 95% CI 8.68 (4.21-17.88). This is in line with study conducted in North Gondar indicating that mothers who didn't visited health institution during pregnancy are more likely to give birth at home [15]. Similarly a study conducted in Rwanda pointed out that the odd of not delivering at home for women who attended ANC and met the goal of 4 standard visits were about 3.6 higher than those who attended only once [20]. This may be due to the fact that during ANC, especially if started early, women are provided with health education and information about the benefits of having a skilled birth attendant for childbirth and also provide opportunities for health workers to promote a specific place of delivery or give

women information on the status of their pregnancy which in turn alerts them to decide where to deliver.

Another interesting finding of this study is that mothers who did not planned their pregnancy are more likely to deliver at home on contrary to those who plan their pregnancy AOR 95% CI (0.22 (0.08-0.55)). This study is consistent with study conducted in rural Andhra Pradesh; India [19]. The possible explanation of this result is women whose pregnancy is desired is more likely to use institutional delivery presumably because she is more concerned about her pregnancy and the child's welfare than those whose pregnancy was not desired.

Choice of husband's place of delivery is another important factor in maternal preference of place of delivery. In this study mother's whose husband's prefer health institution were less likely to deliver at home AOR 95%CI (0.27, 0.07-0.95). This study is similar with a study from Arsi Zone, South-East Ethiopia which showed that Women whose husbands' attitude towards institutional delivery was unfavorable were less likely to utilize the service [21]. Another study from Pakistan showed that about 45% of women with high autonomy, compared to 37% of women with low autonomy had their last delivery at a health facility [22]. Besides, the study conducted in Uganda also indicated that 25% of decision at the onset of labor where to go for delivery was made by the husband alone [23].

Mothers whose husband's educated were less likely to choose home as delivery place AOR 95%CI (0.232, 0.083-0.644). This finding is similar with other study conducted in Munisa Woreda, South East Ethiopia [14]. In contrast to this women whose husbands had secondary and post-secondary education were about 2.8 times more likely to deliver in health facilities as compared to those whose husbands were unable to read and write [14]. The possible explanation for this might be that educated husbands might be more open toward modern health service and aware of the benefits of giving birth at health facilities.

Those mothers who use Horse or Mule back and vehicle as a means of transportation to the health facility were less likely to prefer health institution as a place of delivery AOR 95% CI (0.154, 0.030-0.804). This study is in line with the analysis of EDHS 2000 and 2005 conducted by Asmeret Moges Mehari, Ethiopia [24]. Possibly the accommodation cost that they might face to give birth in a distant health facility is often blamed for the low rate of utilization of delivery care services and are not available in times of need easily.

## 5. Limitations of the Study

- 1) There could be recall bias since the women were asked for events like age and obstetrical difficulties within the last two years prior to the survey. However, the most recent births were considered and local events were utilized to remind them.
- 2) The study only addressed nine Kebeles from 22 total urban and rural kebeles this is due to time and budget constraint.

## 6. Conclusion and Recommendation

This study identified a number of factors that influence preference of place of delivery among women. It revealed that Age at first marriage, ANC attendance, Number of visits for ANC, Planning of pregnancy, Choice of husband to place of delivery, Husband Educational status, and mode of transport used to reach health facility showed statistical association independently with maternal choice of delivery place. These factors are interrelated to each other resulting to low preference of institutional delivery when compared to ANC coverage. Even though women's who attend ANC are likely to deliver in health institution when compared to non-attendees still the proportion of mothers giving birth at health facility is low. Therefore, Women should be provided information on risks of pregnancy, risks of giving birth at home and benefits of giving birth at health facilities.

## Abbreviations

ANC:-Antenatal Care  
 AOR:-Adjusted odds ratio  
 EDHS:-Ethiopian demographic health survey  
 HMIS:-Health management information system  
 MCH:-Maternal and Child Health  
 MDG:-Millennium development goals  
 MMR:-Maternal mortality rate  
 PNC:-Postnatal Care  
 PPH: - Post-Partum Hemorrhage  
 SBA:-Skilled Birth Attendants  
 SSA:-Sub-Saharan Africa  
 TBA:-Traditional birth attendants  
 TTBA:-Trained traditional birth attendants  
 WHO:-World Health Organization

## Declarations

### *Ethics Approval and Consent to Participate*

Ethical clearance was also obtained from the Research and Ethics Committee (REC) of the school of public health. To collect data from participants, explanation was given on the purpose of the study, the importance of their participation and true response. It is also explained that the study will have no connection with individual affairs of respondents. Confidentiality of all data collected was kept. All sample populations were encouraged to participate in the study while at the same time they were told their right not to participate.

### *Availability of Data and Materials*

The finding of this study is generated from the data collected and analyzed based on the stated methods and materials. The original data supporting this finding are available from the corresponding author on reasonable request.

### *Competing Interests*

"The authors declare that they have no competing interests".

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### Authors' Contributions

The authors' responsibilities were as follows:-DK participated in the design of the study, performed the data collection and the statistical analysis and served as the lead author of the manuscript. WM and ZK participated in research planning, assist the data collection, analysis, and paper writing. Besides, WM and ZK ensured quality of the data; assisted in the analysis and interpretation of the data. All authors read and approved the final manuscript.

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