ORIGINAL ARTICLE

Utilization of Institutional Delivery Service in a Predominantly Pastoralist Community of Northeast Ethiopia

Mohammed Ahmed[1]*, Meaza Demissie[2], Araya Abrha Medhanyie[3], Alemayehu Worku[4], Yemane Berhane[2]

OPEN ACCESS

Citation: Mohammed Ahmed, Meaza Demissie, Araya Abrha Medhanyie, Alemayehu Worku , Yemane Berhane. Utilization of Institutional Delivery Service in a Predominantly Pastoralist Community of Afar Region, Northeast, Ethiopia. Ethiop J Health Sci. 2017; 28(4):402. doi:http://dx.doi.org/10.4314/ejhs.v28i4.6
Received: December 25, 2017
Accepted: December 27, 2017
Published: July 1, 2018

Funding: Mekelle University
Competing Interests: The authors declare that this manuscript was approved by all authors in its form and that no competing interest exists.

Affiliation and Correspondence:
[1]School of Public Health, Samara University, Samara, Ethiopia
[2]Addis Continental Institute of Public Health, Addis Ababa, Ethiopia
[3]School of Public Health, Mekelle University, Mekelle, Ethiopia
[4]School of Public Health, Addis Ababa University, Addis Ababa, Ethiopia
*Email: mohafr2008@gmail.com

ABSTRACT

BACKGROUND: ***Maternal mortality is high in sub-Saharan Africa, and most deaths occur around childbirth. In Ethiopia, most births happen at home without skilled delivery attendants, and particularly, the least utilization of skilled delivery is recorded in Afar Region. The factors that influence this utilization are not well documented in the region where utilization has been low. The aim of this study was to determine the prevalence of utilization of institutional delivery and associated factors.***
METHODS: ***A cross-section study with pretested structural questionnaire was conducted from August 5 to September 27, 2015, among women who gave birth within 24 months preceding the survey. A multivariable logistic regression analysis was done to identify factors associated with utilization of institutional delivery.***
RESULTS: ***Out of the total 1842 women, only 339(18.4%) of mothers reported having delivered their youngest child at a health facility. Home delivery was preferred due to cultural norms, low-risk perception, and distance from a health facility. The odds of delivering in a health facility were higher for mothers who attended at least four antenatal visits during the index pregnancy (AOR=3.08,95%CI=1.91-4.96), those whose husbands were educated to secondary school (AOR= 1.86, 95% CI=1.34-2.60), and those that had at least secondary school level education themselves (AOR=1.52, 95% CI=1.03-2.23).***
CONCLUSION: ***Utilization of institution delivery among Afar communities is very low, and less educated mothers are lagging behind. Women's education and full attendance to antenatal care can help increase utilization of skilled delivery services. Qualitative studies to identify socio-cultural barriers are also essential.***

INTRODUCTION

Maternal and still births are intolerably high in sub-Saharan Africa mostly due to lack of access to maternal healthcare during pregnancy and delivery(1, 2). It is known that approximately 15% of all deliveries could involve potentially life-threatening complications(3). Ensuring utilization of institutional delivery services by skilled birth attendants is essential to prevent unnecessary maternal and newborn

deaths(4, 5). The presence of skilled birth attendants, early recognition of complications, timely provision of care and referral when necessary can significantly reduce birth complications and reulting deaths(3, 6). However, a large number of deliveries in developing countries still occur at home without the assistance of skilled birth attendants(7, 8).

According to studies conducted in developing countries, better maternal education, better socioeconomic status, residence close to the nearest health service, urban residence and access to information are the common factors associated with increased utilization of skilled birth(9-11). Many African countries have made substantial efforts to expand the number of health facilities and reduced distance from home. Educational opportunities even for rural populations have been improved.

In Ethiopia, most deliveries take place at home assisted by untrained birth attendants; countrywide only 26.2 % of births occur in health facilities(12). The institutional delivery coverage is lowest in pastoralist communities of the country which consist of more than 10% of the total population(13). For example, in Afar Region, which is one of the pastoralist dominated regions of the country, utilization of institutional delivery services is significantly lower in comparison to the rural settled communities in neighboring states(5, 12, 13). According to the Ethiopian demographic health survey, institutional delivery in Afar Region was 14.7% while it was 56.93% in the neighboring predominantly agrarian region of Tigray(12).

Poor health facilities, inadequate staff, frequent mobility in search of grazing land, and cultural and traditional practices contribute to the low utilization of institutional delivery services in the pastoralist community, have been substantiated with few reports in the literature (14, 15).Therefore, it is imperative to investigate the factors associated with utilization of institutional delivery services in the Afar Region in order to design strategies to overcome barriers hindering predominately pastoralist women from giving birth in health facilities. Therefore, this study determined the prevalence of utilization of institutional delivery service and investigated the factors associated with utilization of the service among mothers in the predominantly pastoralist region of Afar in Ethiopia.

METHODS

This study was conducted in Afar Regional State, one of the nine regions in Ethiopia. The study was carried out in 6 of the 32 districts: Mille, Dubti, Gawane, Amebra, Golina and Ewa districts. The majority of the population are pastoralists and Muslims. The study area has one regional hospital, three zonal hospitals, 14 health centers and 69 health posts. Health centers are the primary access point for delivery services. Health centers are equipped with basic delivery facilities and staffed with skilled delivery attendants. a total of 235 health workers in the facilities at the time of the study and cite 2016 Afar regional health bureau report.

A community-based cross-sectional study was conducted from August 5 to September 27, 2015. The study participants were all women who had resided in the study area for the past six months and gave birth in the last 24 months preceding the study.

The sample size for the study was calculated using single population proportion formula, which assumed institutional delivery service utilization of 6.8%(5), 95% confidence level, margin error of 2%, design effect of 3, and 10% non-response rate. Accordingly, the calculated sample size was 2009. A multistage sampling method was used to enroll study subjects. In the first stage, three out of five zones were selected randomly. Secondly, two districts per zone were randomly selected. Then, three kebeles per district (one urban and two rural) were randomly selected. Then, a census was conducted to identify eligible mothers. Those eligible mothers were proportionally allocated to each kebeles. Mothers were selected using simple random sampling methods based on the list obtained during the census.

Data were collected through face-to-face interviews using structured questionnaire adapted from the Ethiopian Demographic and Health Survey and other published literature. Initially, the questionnaire was prepared in English and then translated into Afar-afa (local language). The questionnaire consists of socio-demographic characteristics of respondents such as age of the mother, place of residence, ethnicity, religion, level of education, occupation of the mother and that of the husband and family size. It also consists of obstetrics history such as service utilization, number of antenatal visits, place for delivery, gravidity, parity, pervious history of obstructed labor and

DOI: http://dx.doi.org/10.4314/ejhs.v28i4.6

history of abortion, kind of assistance received during childbirth and information on distance between home and the nearby health facility, reasons for preferring place of delivery and decision making about the place for childbirth. The questionnaire was pretested in Awash District, not selected for the survey. Following the pretest, a debriefing session was conducted with

field supervisors and data collectors to make the necessary fine-tuning of the questionnaire.

Data were collected by female nurses and health extension workers drawn from areas not included in the study. All data collectors were capable of conducting interviews in the local language (Afar-afa). Data collectors and supervisors were trained for three days by the principal investigator with emphasis on proper conduct of interviews, research ethics and data handling.

In some villages, interviews were conducted either during the morning or late afternoon hours in order to capture eligible pastoralist mothers while they were at their residence. In such areas, the survey team members had to stay overnight in the study villages in order to conduct interviews. The principal investigator and two supervisors checked the completeness of questionnaires on a daily basis.

Data entry and cleaning were done using EPI Data 3.1. Cleaned data were transferred onto SPSS version 20.0 for analysis. Both bivariate and multivariate logistic regression analyse were run to see the association of the independent variables with the outcome variable. Those variables with p-value < 0.05 in COR were included in the multivariate analysis. The crude and adjusted odds ratios were presented with their 95% confidence intervals.

Ethical clearance for the study was obtained from the College of Health Sciences Ethical Review Committee at Mekelle University. Letters of permission to conduct the fieldwork was obtained from the Afar Regional Health Bureau and the local administration office in the study districts. Voluntary informed verbal consent was obtained from each study participant.

RESULTS

A total of 1842 eligible women were successfully interviewed yielding a response rate of 91.7%. The majority of the respondents were rural residents [1244(67.5%)], Muslims [1734(94.1%)], married [1773(96.3%)], housewives [1493(81.1%)], illiterate[1143(62.1%)], pastoralist by occupation [1351(76.2%)] and Afar in ethnicity [1520(82.5%)]. The mean age of the mothers was 26.6 with SD ±5.5, range 15-48 years (Table 1).

Table 1: Socio-Demographic characteristics of women and husband in six districts, Afar region stat, North East Ethiopia, August- September 2015, (n=1842).

Characteristics	Frequency	%
Residence		
Urban	598	32.5
Rural	1244	67.5
Current age of Mother's		
15-19	149	8.1
20-24	511	27.7
25-29	611	33.2
30-34	368	20.0
35-39	159	8.6
>=40	44	2.4
Mean±SD	26.6	(±5.5)
Marital status currently		
Married	1773	96.3
Widowed	28	1.5
Divorced	26	1.4
Single	15	0.8
Ethnicity		
Afar	1520	82.5
Amhara	213	11.6
Oromo	47	2.6
Tigre	26	1.4
Others(specify)	36	2.0
Religion		
Muslim	1734	94.1
Orthodox	81	4.4
Others	27	1.5
Educational level of mothers		
Not attend school	1143	62.1
Primary	434	23.6
Secondary	244	13.2
More than secondary	21	1.1
Educational level of Husbands=(1773)		
Not attended school	949	53.3
Primary	403	22.7
Secondary	218	12.3
More than secondary	203	11.4
Occupation of Mothers		
House wife	1493	81.1
Pastoralist	182	9.9
Gov employee	82	4.5
Others	85	4.6
Occupation of Husbands=(1773)		
Pastoralist	1351	76.2
Merchant	128	7.2
Gov employee	155	8.7
Others	139	7.8

DOI: http://dx.doi.org/10.4314/ejhs.v28i4.6

Of the 1,842 mothers, 41.4% reported parity of 1-2, and 21.1% had 5 or more births. The majority of the study participants (72.1%) had 5 or more family members. Moreover, a substantial number of women (34.6%) did not attend ANC at all while only 17.5% of them attended the recommended four ANC during their last pregnancy. History of abortion was reported by 440(23.9%), and 371(20.1%) mothers reported history of obstructed labor (Table 2).

Table 2: Obstetric characteristics of women in six districts, Afar region, Northeast Ethiopia August-September 2015 (n=1842).

Characteristics	Frequency	Percent
Number of alive birth (parity)		
1-2	762	41.1
3-4	692	37.6
>=5	388	21.1
Family size		
1-2	94	5.1
3-4	419	22.7
5+	1329	72.1
Obstructed labor history		
No	1471	79.9
Yes	371	20.1
History of terminated pregnancy		
No	1402	76.1
Yes	440	23.9
ANC visit during last pregnancy		
No visit	637	34.6
1st -3rd	883	47..9
4th & above	322	17.5
Advice during ANC where to delivery		
No	710	58.9
Yes	495	41.1
Place of last birth		
At home	1503	81.6
Health facilities	339	18.4
Assistant During Delivery At Home (N=1503)		
TBA	1276	84.9
Mothers	163	10.8
HEW	40	2.7
Neighbor	24 (1.6)	1.6
preferred to attended for delivery		
Male	65	3.5
Female	1399	76.0
Both male and female	378	20.5
Time taken to nearly delivery facility		
<=30 mints	1009	54.8
>30 mints	833	45.2
Health facility provide delivery service at Kebeles (sub-district)		
No	756	41
Yes	1086	59
Transportation to reach the health facility		
Public Transpiration	882	47.9
Ambulance	674	36.6
Others	286	15.5

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Among the reasons given for attending ANC services, 717(38.9%) wanted to know their health status, 390(32.4%) visited due to sickness, and 279(15.1%) attended to know the health status of their fetus (Figure 1). Overall, 339(18.4%, 95% CI: 16.5-20.1) mothers reported institutional delivery for the last birth. The major reasons for not utilizing delivery services included cultural norms, uncomplicated labor, long distance to health facility from home and lack of transportation (Figure 2).

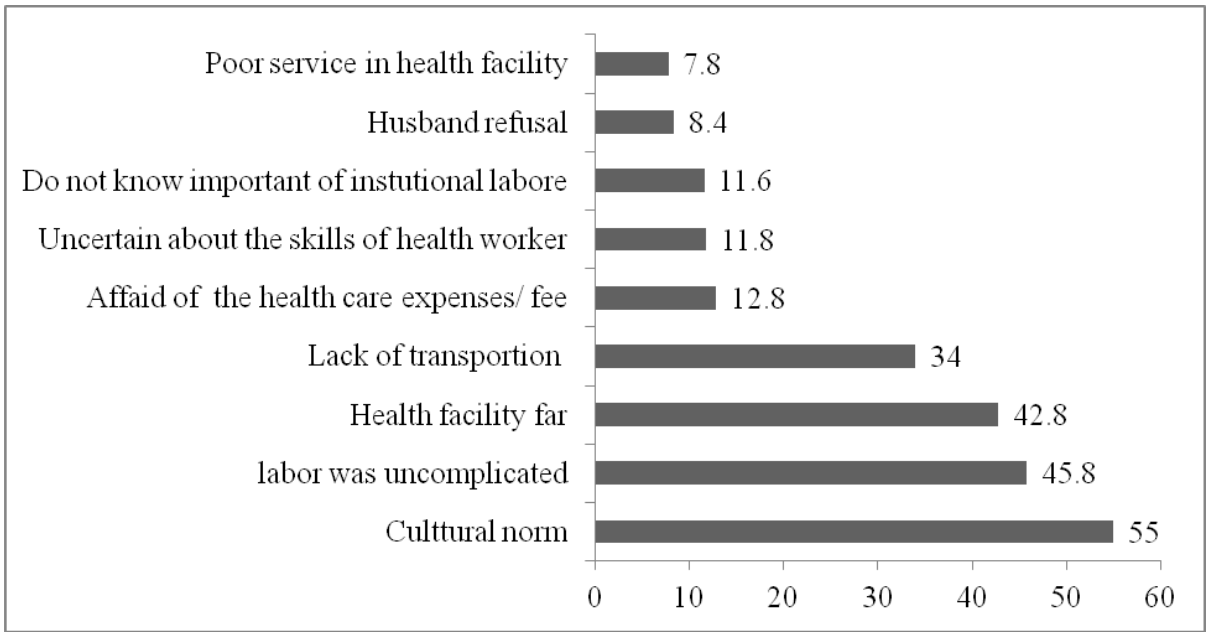

***Figure 1**: Reasons for attanding ANC among mother who gave birth at home in Afar region ,NorthEast Ethiopia, 201 (The total is above 100% because of Multiple response).*

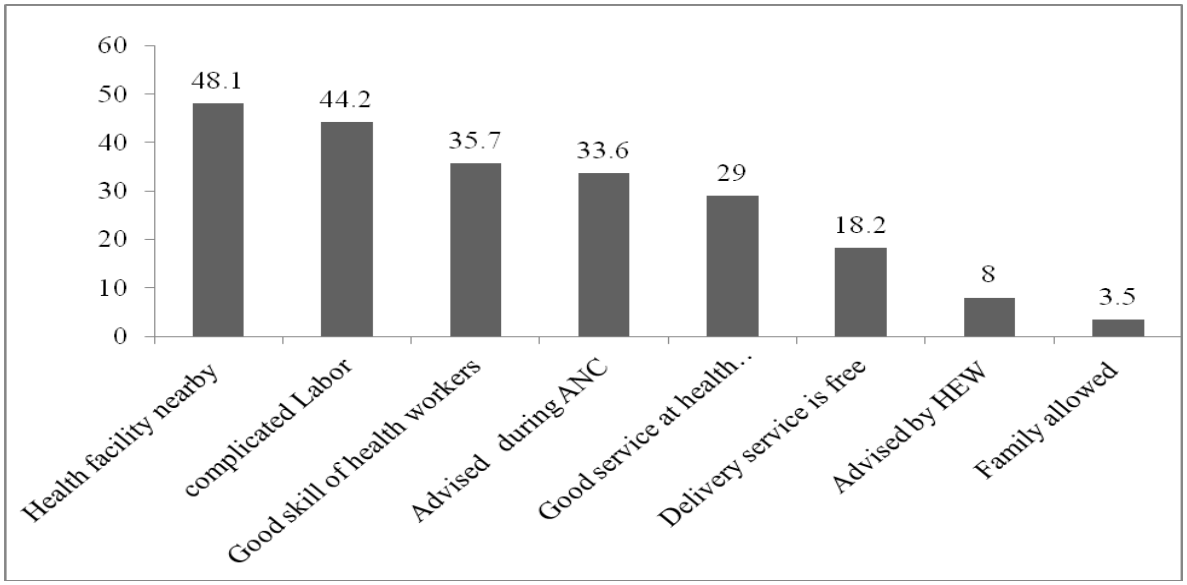

***Figure 2**: Reasons for home delivery among mother who gave birth at home in Afar region, NorthEast Ethiopia, 2015 (The total is above 100% because of Multiple response)*

DOI: http://dx.doi.org/10.4314/ejhs.v28i4.6

The major reasons for utilizing delivery services at the health facilities included the proximity of health facility, facing complicated labor, presence of reputable health workers, advice during ANC visit to deliver in a health facility and positive perception of services in the health facility (Figure 3).

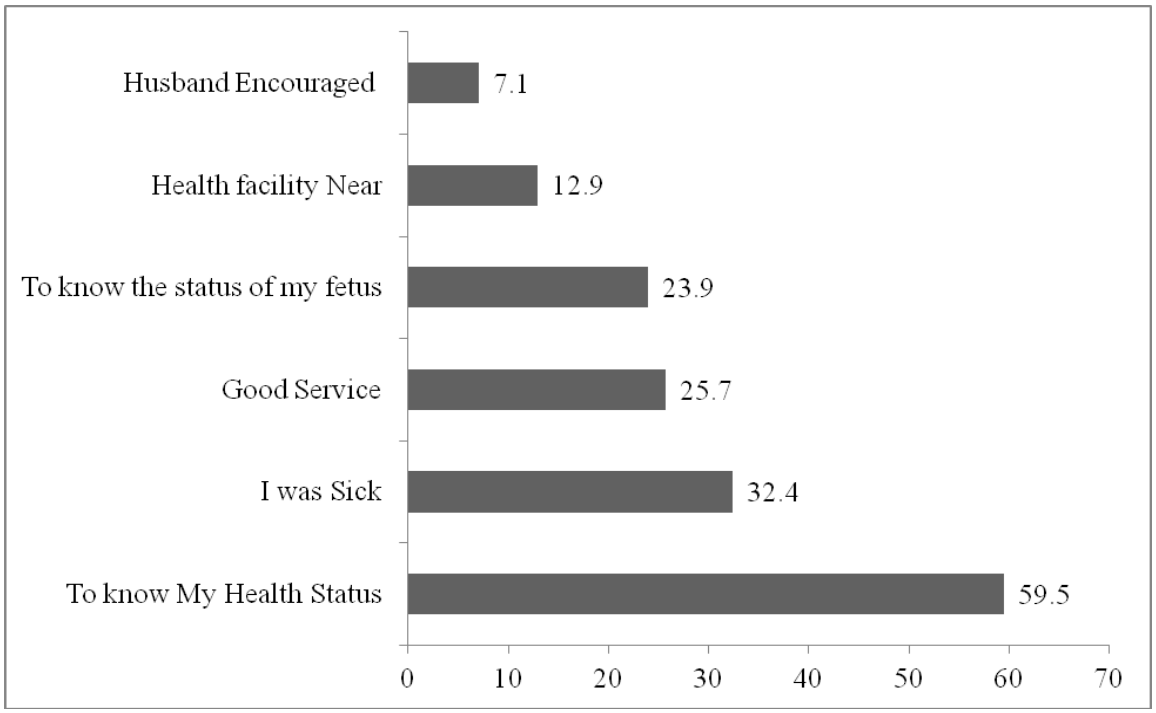

***Figure 3**: Reasons for health facility delivery among mother who gave birth in health facilities in Afar Region, Northeast Ethiopia, 2015 (The total is above 100% because of Multiple response).*

The odds of institutional delivery was significantly higher among mothers who had secondary or above education as compared to mothers with no education (AOR =1.52; 95% CI= 1.03-2.23); mothers whose husbands attended primary school compared to those whose husbands had no formal education (AOR = 1.72, 95% CI = 1.23-2.41); mothers whose husbands attended secondary or above compared to those whose husbands had no formal education (AOR = 1.86, 95% CI =1.33-2.60). Likewise**,** mothers who were living within 30 minutes walking distance or less from a health facility compared to those who lived more than 30 minute distance were higher odds(AOR = 1.39, 95% CI= 1.05-1.84).Concerning to ANC visits, mothers who attended 4 or more ANC visits compared to those who did not have ANC visit during the pregnancy had higher odds (AOR = 3.08, 95% CI = 1.95-4.96). Regarding the sex preference, mothers who had no sex preference of service providers compared with those who prefer to be attended only by female service providers were higher odds (AOR = 1.76, 95% CI = 1.30-2.39). (Table3)

DOI: http://dx.doi.org/10.4314/ejhs.v28i4.6

Table 3: Socio-Demographic and Obstetric factors affecting place of delivery among mothers having a child in the last 24 Months in Afar region, Northeast Ethiopia, 2015 (n==1842)

Variable	Place of delivery		COR 95% CI	AOR 95% CI
	Health Facility N (%)	Home N (%)		
Residence				
Urban	141(23.6)	457(76.4)	1	1
Rural	198(15.9)	1046(84.1)	**0.61(0.48-0.78)***	1.26(0.92-1.74)
Currant age of Mother				
15-19	41(27.5)	108(72.5)	**2.11(1.25-3.56) ***	1.16(0.59-2.27)
20-24	85(16.6)	426(83.4)	1.11(0.71-1.73)	0.59(0.33-1.03)
25-29	120(19.6)	491(80.4)	1.36(0.88-2.09)	0.94(0.56-1.56)
30-34	62(16.8)	306(83.2)	1.12(0.70-1.80)	0.97(0.58-1.63)
>=35	31(15.3)	172(84.1)	1	1
Ethnicity				
Afar ethnic	252(16.6)	1268(83.4)	1	1
Others	87(27)	235(73)	**1.86(1.41-2.47)***	0.73(0.49-1.09)
Religion				
Muslim	298(17.2)	1436(82.6)	**0.34 (0.23-0.51) ***	**0.50(0.30-0.83)***
Others Christian	41(38)	67(62)|	1	**1**
Educational level of mothers				
Not attended	150(13.1)	993(86.9)	1	1
Primary	104(24)	330(76)	**2.09(1.58-2.76) ***	1.35(0.98-1.87)
Secondary and more	85(32.1)	180(67.9)	**3.13(2.29-4.26) ***	**1.52(1.03-2.24)***
Occupation of Mothers				
House wife	263(17.6)	1230(82.4)	0.77(0.58-1.02)	
Others	76(21.8)	273(78.2)	1	
Educational level of husband (n=1773)				
Not attended	111(11.7)	838(88.3)	1	1
Primary	100(24.8)	303(75.2)	**2.49(1.85-3.37) ***	**1.72(1.23-2.41) ***
Secondary and more	118(28.0)	303(72.0)	**2.94(2.20-3.93) ***	**1.87(1.33-2.60) ***
Occupation of Husbands (n=1773)				
Pastoralist	229(17)	1122(83)	**0.67(0.51-0.87)***	1.02(0.75-1.38)
Others	99(23.5)	323(76.5)	1	1
Parity				
1	605(79.4)	157(20.6)	**1.68 (1.19-2.36)***	1.02(0.61-1.69)
2-4	562(81.2)	130(18.8)	**1.50(1.05-2.12)***	1.22(0.81-1.83)
≥5	336(86.6)	52(13.4)	1	1
Family size				
1-2	11(11.7)	83(88.3)	0.64 (0.33-1.21)	0.80(0.37-1.77)
3-4	99(23.6	320(76.4)	**1.49(1.14-1.94) ***	1.22(.82-1.80)
5+	229(17.2)	1100(82.8)	1	1
Obstructed labor history				
No	285(19.4)	1186(80.6)	1	1
Yes	54(19.4)	317(85.4)	**0.71(0.52-0.97)***	0.71(0.51-1.00)
Abortion/terminated pregnancy				
No	277(19.8)	1125(80.2)	1	1
Yes	62(14.1)	378(85.9)	**0.69(0.49-0.91)***	0 .83 (0.59-1.15)
Advices in ANC where to delivery				
No	183(14.9)	1045(85.1)	1	1
Yes	156(25.4)	458(74.6)	**1.95(1.53-2.47)***	1.11(.83-1.49)

DOI: http://dx.doi.org/10.4314/ejhs.v28i4.6

Table 3. Continued….

ANC visit during last pregnancy				
No visit	46(7.2)	591(92.8)	1	1
1st -3rd	196(22.2)	687(77.8)	**3.67(2.61-5.15) ***	**2.84 (1.87-4.32)***
4th & above	97(30.1)	225(69.9)	**5.54(3.78-8.12) ***	**3.08(1.92-4.97)***
HF give delivery service at Kebele				
No	92(12.2)	664(87.8)	1	**1**
yes	247(22.7)	839(77.3)	**2.13(1.64-2.76)***	1.03 (0.74-1.43)
Distance of HF for delivery				
<=30 minute	224(22.2)	785(77.8)	**1.78 (1.39-2.28)***	**1.39 (1.05-1.84)***
>30 minute	115(13.8)	718(13.8)	1	1
Preference for gender delivery				
Female	209(14.9)	1190(85.1)	1	1
Male	16(24.6)	49(75.4)	**1.86(1.04-3.33)***	1.38(0.71-2.63)
Male and female	114(30.2)	264(69.8)	**2.46(1.89-3.20)***	**1.76(1.30-2.39)***

HI=Health institute COR=Crude odds ratio AOR=Adjusted odds ratio ANC=Antenatal care HF=Health facility

DISCUSSION

This community-based study revealed that only 18.4% of the mothers delivered at health facilities while the great majority (81.6 %) of them delivered at home. Educational status of the mother and husband, ANC visits during last pregnancy and distance from the nearest health facility were significantly associated with institutional delivery service utilization.

Although the rate of utilization of institutional delivery services we found was better than what was recorded five years back, it is still very low when compared to other areas in Ethiopia and other developing countries(12, 16-18). These large differences in utilization might be due to the differences in the context of studies as well as social and cultural variations. The observed association between ANC attendance and better chance of utilization of institutional delivery is in agreement with previous studies(12, 19, 20). Mothers with frequent ANC visits may have had better information on where to give birth which could have influenced their decision to give birth in health facilities.

Educational status of the husband is an important factor to allow women to utilize delivery service(19, 21).Women who have husbands with at least primary level education were more likely to give birth in health institutions. In addition, women's education is reported to have a positive effect on the use delivery services particularly if they attend secondary and above education(19, 22). The relationship between education and institutional delivery has been consistently reported in other similar studies conducted in Ethiopia (19, 21, 23, 24) and in other countries(24, 25). Thus, access to formal education would be important in improving the utilization of institutional delivery.

The Long distance between residence and health facilities was the most common reason for choosing home for delivery. This finding is in line with the finding of other similar studies conducted in Ethiopia and other developing countries(25-27). We observed that women who had to travel long distance were less likely to give birth at health facility. Thus, making health institution accessible would increase the chance of using the health facility delivery services.

In the study area, laboring women are not comfortable exposing their private parts to others especially to male health workers. As a result, 76% of respondents in this study preferred to attend the services by a female health worker. In the efforts to increase institutional delivery, due consideration needs to be given to socio-cultural issues. Assigning more female health workers in the delivery units can help increase the utilization of delivery service(28).

Due to cultural pressure, we expected that some women may not be comfortable responding

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to questions related to birthing events. To minimize that limitation and associated bias, data collectors were trained to conduct all interviews in privacy and to keep completed questionnaire in a strictly confidential manner. Thus, we believe the bias related to respondents' reluctance was minimal. Moreover, to minimize recall bias, we restricted questions only to the most recent birth. Despite these limitations, this study is one of the few large scale studies conducted in pastoralist communities.

It can be concluded that utilization of institutional delivery service is very low in the study setting. Attending the recommended number of ANC visits and education were significantly associated with institutional delivery. Proper dissemination of information regarding the availability of delivery services and removal of social and cultural barriers can help increase the utilization of delivery service by pastoralist women. Furthermore, conducting qualitative studies is necessary to explore the influence of culture, belief, traditional practices and seasonal mobility on the utilization of institutional delivery services.

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DOI: http://dx.doi.org/10.4314/ejhs.v28i4.6