



Determinants of Delivery Practices among Zone 3, Afar Pastoralists of Ethiopia

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Abstract

Background: In a previous qualitative study in Afar , it was demonstrated that most of the mothers deliver at home, assisted by TBAs; the main reason being the distance to health facilities, as well as the long trust developed in TBAs. The objective of this study was to identify delivery determining factors in the Afar community.

Method: This cross sectional study was conducted in April 2011 in zone 3 of Afar regional state, Ethiopia. Through a door-to-door survey of households, quantitative data were collected in respect of 478 women who gave birth during the last one year.

Results: Out of 478 interviewed mothers in the urban/rural 398 (83.3%) gave birth to the youngest child at home; 370 (92.5%) assisted by TBAs. Only 3.2% of them were delivered assisted by Health Extension Workers/nurses in health posts or at home. The main reason given for home delivery was that the labour was fast and there was no time to go to one of the health facilities. Distance to health facilities and issues relating to transport accounted for over 72% of the reasons given. We found an association between health facility delivery and ANC attendants, educational status and occupation of the husband/wife (mother) and gravidity and parity ($p < 0.05$); but there was no association with the number of wives the husband has ($p > 0.05$). Out of the 197 urban mothers interviewed, 49 (24.8%) of them delivered in health facilities and as one's economic status increases, the likelihood of health facility delivery is higher compared to the poor ($p < 0.01$). There was no association between the rich and the poor in health facility delivery in the rural set up. In the adjusted model, ANC attendants, educational status of mother, were significantly associated with health facility delivery. Women in the highest wealth category in urban areas are 2.8 times more likely to deliver in health facilities (OR: 2.8; 95% CI: 1.2-6.5), but there was no significant association by asset level among the rural households.

Conclusion: Most of deliveries in the study community take place at home, educated mothers and ANC attendant mothers have high tendency to deliveries in the health facilities. The programme needs to strengthen the capacities of mothers to attend ANC services, as well as build the capacity of HEWs and nurses working in health posts, in order to win the confidence of the community. Probably assigning TBAs with HEWs to attend deliveries in health posts will help bring the mothers to health posts for clean delivery. Organizing an ambulance for referred cases is a must to address the transport issue.

Introduction

More than 90 % of the maternal deaths in the world happen in Sub-Saharan Africa (SSA) and Asia, whilst women in north Europe have a 1 in 4,000 likelihood of dying from pregnancy related causes. For those in Africa, the chance is 1 in 16 (1). Most of these deaths occur because the health facilities are distant; no transport; poor roads; cost of service is high for mothers and inadequate skilled attendants; poorly motivated staff; inadequate equipment and supplies; and weak referral systems (2).

In low and middle income countries, most deliveries take place at home without the assistance of trained attendants (3-5). Although the annual maternal deaths have decreased from 526,300 in 1980 to 342,900 in 2008, even now only 23 countries are able to fulfill the Millennium Development Goal (MDG5) (6). The MDG5 is to reduce maternal mortality ratio by 75 per cent by 2015 (7). World Health Organization indicated that each year about 3.7 million children die within the first 28 days and close to 9.7 million children die before their fifth birthday (8). UNICEF stated that progress towards reaching MDG4, the goal of reducing the under-five mortality rate by two thirds by 2015, is “insufficient” in the Middle East and North Africa, SSA and South Asia (9). The burden of maternal mortality remains greatest in SSA (10). Studies have shown that around 20 – 30% of neonatal deaths can be also averted, if deliveries are attended by skilled birth attendants (11).

Home deliveries are common in developing countries. Studies in some countries reported that home deliveries range from 16% in Mumbai (India), 22% in Senegal, 65% in Tanzania to 87.7% in Bangladesh (12, 13, 14 and 15). The main reasons given by mothers for home deliveries is distance to health facilities (13, 14, 16 and 17); cost for medical care; delivery complications; low education level and absence of ANC (18 and 19).

This study was designed to get information on the rate of home delivery and the determining factors for institutional delivery, among rural and town women of zone 3 of Afar region.

Methodology

Study area

This study was conducted in Zone 3 of Afar regional state of Ethiopia. This Zone is divided into six districts namely Awash, Amibara, Birumodytu, Gewane, Dulessa and Argoba special districts. The total population of Afar regional state is 1,418,000 and the study zone population is nearly 200,000(CSA 2007). Afar regional state is located in the eastern part of Ethiopia and lies in the East African Great Rift Valley. In the west it is bordered by Tigray, Amhara and Oromia regional states; in the south with Somali regional state; in the east with

Djibouti and in the north with Eritrea. It is a semi-arid region and more than 90% of the population is pastoralists.

Study design and sample size

A cross-sectional design was employed for interviewing women, between the ages of 15 - 49 (reproductive age groups) who delivered within the last one year, on determinants of delivery practices.

The sample size is calculated using Epi-Info version 3.3 for Windows for single proportion formula. Calculation is based on the assumption of Type I Error of 5%, reported delivery in health facilities of 12.9%(Afar Regional Health Bureau 2006/2007 report), and the designing effect of 3 with 5 % non response rate. Total sample size then was 502 women between the ages of 15 - 49 years old.

Estimated household size in each *woreda* was obtained from the national population and housing census report. The number of women to be interviewed (502) was allocated equally to 4 *woredas*. Then, 12 *kebeles* were randomly selected in each *woreda* and the allocated households for the *woreda* were equally distributed amongst the *kebeles* (which amounted to about 11 mothers per *kebele*). In each selected *kebele*, the centre of the *kebele* was identified as the starting point and a bottle was spun to determine the direction to be followed. The survey then started from the nearest house to the direction of the bottle top, and continued in the determined direction. Households were surveyed sequentially until the desired number was obtained. All women in the age category of 15 - 49 years old, from the sampled households, who gave birth during the last one year, were interviewed using the survey questionnaire.

Data collectors who had previous experience of data collection were recruited and trained for two days on how to conduct the questionnaire. The questionnaire was initially developed in English and translated to Amharic for data collection. The questionnaire was tested and finally all findings from pre –test incorporated.

To estimate the rural households' asset levels, a wealth ranking was conducted, based on the following five categories, namely poorer (cows/oxen 0, camels 0, sheep/goats less than 5); poor (cows/oxen less than five, camels 0, sheep/goats between 5 - 9); middle (cows/oxen 5 - 9, camels 1 - 5, sheep/goats 10 - 19); rich (cows/oxen 10 - 29, camels 5 - 9, sheep/goats 20 - 49) and richer (cows/oxen 30 and above, camels 10 and above, sheep/goats 50 and above). During the data collection, the number of each category of animal was collected from the sampled households.

Data Analysis

During the data collection, supervisors watched over the data collectors on site and every evening checked the data for accuracy, consistency and completeness. The data was entered and analyzed in SPSS software (version 16). The association between the socio-demographic

and reproductive variables, ANC attendance and delivery place were analyzed using Pearson's Chi-square test. Logistic regression analysis was also used to measure unadjusted and adjusted odds ratios to identify the predictors of health facility delivery.

The asset level for the rural was calculated, taking the average market value of each category of the animal in *Birr* and fitted with the wealth categories that were developed in the wealth ranking exercise to get the total asset of the household. However, it was found during analysis, the middle and rich categories were few, therefore for convenience of the analysis, the data merged into rich and poor only. The richer, and the rich categories merged as rich and the other as poor.

Results

Socio-demographic characteristics

Out of the sampled 502 mothers who delivered during the last one year, 478 (95%) were able to be interviewed. Out of all of those interviewed, 347 (72.7%) belong to the Afar ethnic group, and Amhara account for 47 (9.8%), and the rest at 83 (17.8%) belong to various groups. The majority of the women, 468 (97.3%), are living within marriage and only 1.7% were found to be single. The socio-demographic characteristics are presented in Table 1.

Delivery place

Out of the 478 mothers interviewed about the place of their last delivery, 398 (83.3%) delivered at home and the reminder 16.3% gave birth in health facilities. Among women who gave birth at home 370 (92.5%) of them were assisted by TBAs and about 3.6% by Health Extension Workers/nurse with 3.2% by a neighbor. Out of all the reasons given why they preferred home deliveries, 205 (51.5%) of them said that it was because labour was fast and there was no time. Cultural ceremonies at home deliveries and confidence in health facilities were not reasons to choose home deliveries (Table 2).

As shown in Table 1, there is an association between home delivery and age, educational status and occupation of the husband/wife (mother), and gravidity and parity ($p < 0.05$), but there was no association with the number of wives the husband has ($p > 0.05$). Out of 197 urban mothers interviewed, 49 (24.8%) of them delivered in health facilities; moreover, as their economic status increases the likelihood of health facility delivery is high, as compared to the poor ($p < 0.01$) (Table 3). There was no association between the rich and the poor in health facility delivery in the rural set up when the rural and urban income level was analyzed separately. And also there is high association between mothers' educational status and health facilities delivery ($p < 0.01$).

The choice of TBAs is mostly related to the emergency nature of deliveries. The reasons for their choice of health facility for their delivery were: fear of bad outcome for themselves and the fetus 42 (45.7%); referral by TBAs 19 (20.7%); referral by HEWs 9 (9.8%) and from previous risk during home delivery 16 (17.4%).

Antenatal Care (ANC) Practices

Of the 478 women who were asked about their ANC follow up for their last pregnancy, 305 (63.8%) had attended ANC at least once during their pregnancy. For those, who did not attend ANC, 48 (50%), as described in Table 3, the main reason for not doing so was mainly related to distance of health facilities and a few, 12 (13%), said that there is no advantage of ANC.

Most of the interviewed mothers, 425 (88.9%), said that every pregnancy has a risk for the mother and the fetus. As shown in Table 4, there is a significant association between attending ANC and knowing the advantages of ANC ($P < 0.05$), but there is no significant association of knowing pregnancy/delivery danger signs and ANC attendance ($P > 0.05$), except for difficulty of breathing in pregnancy ($P < 0.05$).

Concerning the knowledge and skills of HEWs in conducting ANC, 269 (56.3%) of the mothers said that HEWs are superior to TBAs in terms of knowledge and skill; 96 (20.1%) said that TBAs are superior; 64 (13.4%) were not able to compare; 22 (4.6%) said they are not different and 19 (4%) said HEWs cannot conduct ANC.

Predictors of using health facility delivery

A logistic regression model was applied for variables which showed significant association. These variables were gravidity, age of mothers, ANC attendants, occupation and educational status of husband/wife. Educational status of wife and ANC attendants' mothers showed significant association from all variables with $P = 0.036$ and 0.00 level of significances respectively.

Discussions

Most mothers in the study community (83.3%) deliver at home; less than 25% deliver in health facilities. The main reason given for home deliveries is that the emergency nature of delivery does not allow the mothers to be transported to health facilities. Most mothers live in the rural far from walking distance to health facilities, plus there is no transport system. Studies in other countries have also come up with the same results, whereby distance plays the main part in determining health facility delivery (2, 4, 5, 10, 13, 16, and 17). Home ceremonies during delivery were not found to be the factors for choosing home deliveries in our study community. TBAs are still the main attendants whilst there are HEWs and nurses in some of the study *kebeles*. The findings show that most mothers believe that HEWs are superior in skill than TBAs; however, a significant proportion also prefers TBAs and even some are doubtful about the skills of HEWs. In our previous qualitative study in the same

area, discussants said that they do not have confidence in HEWs. The reason being is that HEWs' training is short; they are young and have not proven themselves like TBAs (authors unpublished data). The difference in the reasons given between the two studies may be due to social desirability bias in the quantitative study. Considering that the data collectors come from the government, it may have been seen to be opposing the government idea to label HEWs lower than TBAs. This is an area which needs intervention in order for the community to develop confidence in HEWs assigned in health posts. One possibility is to bring the labouring mother to the health posts and the TBA comes with her so that both the TBA and the HEWs assist together. This would give a better chance of a clean delivery at a health post and would enable a referral to be organized if the mother needs one.

In this study, we found association between ANC attendance and delivering in health facilities. In the town respondents' health facility, delivery is significantly associated with the income of the household, whilst it is not a factor for the rural. In the rural, whether the mother has money or not, there is no transport and no time to take a labouring mother to health facilities. Again in our previous study, it is only when the mother failed to deliver at home that the community takes the mother to a health facility. This does not require a lot of money, as it is a communal responsibility. In health facilities, delivery is free unless the mother needs to go to hospital wherein the family would incur transport costs.

Although there is an association between status of education and health facility delivery, ANC and knowing the advantage of ANC, there was no association between delivery in health facilities, and knowing the danger signs in pregnancy/ delivery. This can be due to the distance of health facilities for most mothers as there is no chance even if they wanted to go because there is no transport system to take the mother to the health facilities. There is a need to design an affordable and appropriate transport system for the area. Rickshaw ambulances can work for Afar as most of the area is flat. Rickshaws are cheap and their maintenance cost is low. The other option is to organize a camel-pulled cart. Ambulances that can be stationed in health centres to transport mothers from health centres to hospitals are crucial. Hospitals are more than 200 kms from the study areas.

Based on the findings, several recommendations can be made. The first recommendation is to teach mothers on the importance of ANC and institutional delivery. Along with this, developing the competence of HEWs and equipping health posts are important steps to increase skilled birth attendance nearer to the community. TBAs are still much preferred by the community for good reasons. There is no way for HEWs to get the community's confidence over the TBAs in the short term. We need to understand and communicate the concerns of the community. A middle ground strategy of encouraging TBAs to attend all deliveries in health posts, together with HEWs, should be designed. This way, clean delivery can be given to the mothers. If the community ambulance system, as mentioned above, is attached to health posts, mothers with difficult labours can be referred on time to health centres. In the towns, deliveries still take place at home and there is a need to educate the

mothers. Ambulance service for health centres will facilitate the transportation of mothers to hospitals.

For Peer Review

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Table 1: Characteristics of respondents, for home and institutional delivery in Zone 3 of Afar region

Characteristics	Home delivery	Institutional delivery	P-value	Pearson Chi-square
Women's Age			0.003	14.29
15 – 18	11	7		
19 – 24	114	30		
25 – 29	110	23		
>=30	163	18		
Educational Status of mother			0.000	41.67
Cannot read and write	324	39		
Read and write only	10	2		
Primary school 1 – 8	43	15		
Secondary school 9 – 10	16	12		
Higher education/university/college 10+	4	6		
Educational Status of husband			0.000	53.9
Cannot read and write	285	24		
Read and write only	27	8		
Primary school 1 – 8	32	18		
Secondary school 9 – 10	33	14		
Higher education/university/college 10+	15	12		
Occupation of mother			0.003	18
House wife	352	58		
Government/private employee	22	13		
Merchant	5	2		
Pastoralist	6	0		
Semi-pastoralist	2	2		
Other	11	3		
Occupation of husband			0.000	58.4
Farmer	25	3		
Government/private employee	116	4		
Merchant	45	5		
Pastoralist	10	1		
Semi-pastoralist	101	53		
Daily labourer	64	5		
Job less	19	3		

Other	14	4		
Gravidity/number of total pregnancies			0.031	18.39
0	0	0		
1	74	22		
2	78	22		
3	77	18		
4	53	10		
5	45	4		
>=6	62	2		
Parity/number of living children			0.07	15.72
0	0	0		
1	83	24		
2	80	20		
3	79	19		
4	51	9		
5	45	4		
>=6	48	1		
Number of wives a husband has			0.566	2.03
1	349	71		
2	40	6		
3	7	0		
4	1	0		
Monthly Income (Birr)				
<500	100	16	0.00	24.25
500-1000	44	25		
1001-2000	4	7		
>2000	0	1		
ANC attendants			0.00	26.3
Yes	233	70		
No	160	8		

Table 2: Reasons given for home delivery

Reason	Frequency	%
Labour too quick to reach health institution	205	51.5
Home delivery is more comfortable	52	13.0
Health facilities are too far	61	15.3
No transport	26	6.5

Cost of medical services	6	1.5
Home deliveries allow family and friends to attend the delivery	12	3.0
Home deliveries allow cultural ceremonies to be conducted	0	0
Health facilities are not clean	2	0.5
Health workers are not friendly	20	5.0
Health centres do not provide special services to make them different from TBAs	0	0
Missing data	14	3.5
Total	398	

Table 3: Reasons for not attending ANC

<i>Reasons</i>	<i>Number</i>	<i>Relative %</i>
Health facility far	46	50.0
No health facility in the area that provides ANC	8	8.7
No advantage of ANC	12	13.0
Health Workers are not friendly	1	1.1
High transport cost	10	10.9
High medical cost	7	7.6
Health facilities are not clean	1	1.1
Husband/family did not approve of ANC	2	2.2
Other	5	5.4
Total	92	100.0

Table 4: The relationship between knowing risk factors of pregnancy/delivery and attending ANC

Characteristics	Number	% of women attended ANC	P- Value	Pearsons Chi-Square
Advantages of ANC				
Assess maternal health	374	75.1	0.000	90.9
Assess fetal health	272	77.9	0.000	49.8
Assess fetal position	183	84.2	0.000	50.28
Assess possible delivery complication	111	86.5	0.000	30.55
No advantage	9	22.2	0.007	7.18
I don't know any advantage	63	6.3	0.000	106.9

Other	7	57.1	0.68	0.17
Danger signs of pregnancy/delivery				
Bleeding during pregnancy	215	68.4	0.124	2.36
Fever	147	68.7	0.218	1.52
Convulsion	47	72.3	0.247	1.34
Difficulty in breathing	37	81.1	0.03	4.7
High blood pressure	18	72.2	0.495	0.47
Edema of hands and face	104	68.3	0.386	0.75
Decreased/absent fetal movement	15	60.0	0.7	0.15
Labour more than 12 hours	56	64.3	0.966	0.00
I don't know	50	56.0	0.174	1.85
Other	49	65.3	0.923	0.01

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