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Pastoralism and antenatal care service utilization in Dubti District, Afar, Ethiopia, 2015: A cross-sectional study

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Abstract

Health service utilization among pastoralists in Ethiopia is not well documented. Available data are very few and institution-based. Health services are particularly inadequate and poorly equipped, being scarce, inaccessible, and inappropriate to the pastoralist way of life. Effective antenatal care (ANC) use has been shown to influence women's use of maternal health services, probably the most effective intervention in reducing maternal mortality in the developing world. Despite many studies done on ANC service utilization among agrarian women, the studies done on pastoralist women are almost negligible. Therefore, this study assesses utilization of ANC services among pastoralists of Afar Region, Ethiopia.

A community cross-sectional study was carried out from 5 January to 5 February, 2015. The data was collected by interviews through a questionnaire. Statistical analyses were done to describe pertinent findings.

Of 788 women, 42.4 % (334) made at least one ANC visit, while 19.5 % (65) had adequately utilized ANC (i.e. made four or more ANC visits). Only 9.7 % of women visited an ANC centre during the first trimester (12 weeks). Institutional delivery service utilization of the district was extremely low at 7.4 % (58). Educational status of the mother had a significant association with institutional delivery. Mothers who attended college/university were five times more likely to utilize delivery service than those mothers who are illiterate. ANC utilization in peri-urban areas was two times more than ANC utilization in rural areas with CI of 1.376, 3.595. Multivariate analyses, being in peri-urban residence (adjusted odds ratio (AOR) = 2.224; 95 % CI 1.38, 3.60), possessing radio/TV (AOR = 3.134; 95 % CI 2.204, 4.457), were positively associated with ANC service utilization.

Every pregnant woman should receive at least four ANC visits, but only 20 % of the respondents were able to fulfil the recommendation. Pastoralist lifestyles, access, demographic, and socio-cultural barriers affect proper utilization of maternal health services. Increasing service coverage and promotion of available services in the community, accessible health services, transportation and improving information, education, and communication on maternal health services must be intensified to reach women in pastoralist communities of the country. Rigorous efforts are needed to reach disadvantaged groups so as to overcome health inequities between agrarian and disadvantaged pastoralist women.

Keywords: Pastoralism, Antenatal care utilization, Afar Region, Ethiopia

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Background

In Ethiopia, pastoralism and agro-pastoralism are an important means of livelihood for more than four million people, with most pastoralists living in the Afar, Somali, Oromiya, and Southern Nations regions. Ethiopia's arid or semi-arid pastoral lands comprise approximately 63 % of the total land area (MoARD 2008). Afar Region is home to pastoral and agro-pastoral peoples who largely depend on livestock production for their livelihood. They are located in the northeast part of the nation with 90 % pastoralist population (EDHS 2011). More than 92 % of the total population is food-insecure in terms of calorie intake. The illiteracy rate is high; health coverage is low, reaching only 40 %; access to potable water is very low (35.7 %) (PACC, Semera 2010).

Utilization of maternal health services is an effective intervention for reducing the risk of maternal morbidity and mortality, especially in places where the general health status of women is poor (Ochako et al. 2011). Attending antenatal clinics and delivery with a skilled professional can lead to marked reductions in maternal morbidity and mortality through early detection and management of complications (Koria et al. 2012). In sub-Saharan Africa, where 1 in 39 women risks dying from maternal causes in her lifetime; the maternal mortality ratio (MMR) was 500 deaths per 100,000 live births in 2010 (WHO, UNICEF et al. 2012).

In Ethiopia, the estimated maternal mortality rate in 2005 was 673/100,000 live births, but the trend is not showing an improvement, when compared to 676/100,000 live births in 2011. Improvements have been made in the proportion of pregnant women using antenatal care (ANC), with 28 % in 2005, 37 % in 2011, and 40% in 2014 The births attended by skilled health personnel were 6 % in 2005, 10 % in 2011, and 15 % in 2014. The number of births delivered in a health facility ranges from 6 % in Afar to 87 % in Addis Ababa (EDHS 2014).

Several studies have been done worldwide, including in Ethiopia, about factors affecting ANC and delivery in health facilities. These factors cover demography, socioeconomics, availability of health services, accessibility, behaviour, and attitudes of health care providers and socio-cultural issues (Amano et al. 2012; Birmeta et al. 2013; Kesterton et al. 2010). It is argued that differential access to health care facilities between the rural and urban areas is an important factor for lower maternal health care services, particularly for institutional delivery assistance by health personnel in rural areas (Agha and Carton 2011; Birmeta et al. 2013).

In Ethiopia, about 10 % of women deliver in health facilities, but with high variation among regions, with less than 10 % in the Southern Nations Nationalities, Afar, Oromiya, Somali, and Benishangul-Gumuz regions and up to 82 % in Addis Ababa (EDHS 2011). ANC from a skilled provider ranges from a low of 15 % in the Somali region, 28 % in Afar Region, and up to a high of 94 % in Addis Ababa (EDHS 2014).

The organization and distribution of a conventional health service system in Ethiopia does not seem to take into consideration the pastoralists' living patterns. While pastoralists are relatively mobile, looking for water and grazing for their livestock over changing seasons, the usually static health services do not often address their health care needs. Even though there is only little existing evidence on ANC service utilization by agrarian women, nothing is written about pastoralist women of Ethiopia. Therefore, this study is intended to show the low level of ANC attendance by pastoralists of Dubti District of Afar Region, Ethiopia. Understanding this will have an important value for informing policy-makers in designing appropriate strategies for providing maternal health services for pastoralist women.

Study area

Afar national regional state is located in the northeastern part of Ethiopia and lies in the East African Great Rift Valley. It is bordered by the countries of Djibouti in the west and Eritrea in the north. The region is characterized by an arid and semi-arid climate with low and erratic rainfall. The altitude of the region ranges from 120 m below sea level to 1500 m above sea level. Temperature varies from 20 °C in higher elevations to 48 °C in lower elevations. Rainfall is bi-modal throughout the region with a mean annual rainfall below 500 mm in the semi-arid western escarpments and decreasing to 150 mm in the arid zones to the east. Afar is increasingly drought-prone. The production system of the Afar Region is dominated by pastoralism (90 %) and agro-pastoralism (10 %). The region has a total population of 1,411,092, consisting of 786,338 men and 624,754 women (CSA 2008). There are six hospitals, 58 health centres, and 294 health posts which are owned by the regional government. Dubti district is 620 km from Addis Ababa and 12 km from the capital city of the region, Samara. The estimated projected population for 2013 in the district was 66,585 (CSA 2008).

The district is subdivided in to 14 *kebeles* (smallest unit of public administration). There is one referral hospital, two health centres, and nine health posts. There are also six private clinics and seven rural drug venders that are privately owned.

Methods

The cross-sectional study was carried out from January to February, 2015, among the Afar community residents.

Study population

All women of reproductive age (15–49 years) residing in Dubti District were source populations, and women of

reproductive age who gave birth within two years prior to the time of data collection were study populations. Women who gave birth in other places but living in the study area were excluded from the study.

Sample size determination

The sample size was determined by using a single proportion formula: $\frac{n=Z_{(\alpha/2)}{}^2 p(1-p)}{w^2,}$ where n is the sample size; z is the standard normal deviate, set at 1.96 (for 95 % confidence level); w is the desired degree of accuracy (taken as 0.05); and p is the estimate of the proportion of ANC service utilization (assumed to be 63 % $p = 0.63$ (Mekonnen et al. 2012)). Due to the multistage nature of the study, a design effect of 2 was considered. Thus, $n = [1.962 \times 0.63(0.37)/0.052] \times 2 = 716$. Adding a possible 10% non-response rate yield final sample size of 788.

The sample was allocated proportionally for randomly selected *kebeles* of the district. Final target households were reached by multistage cluster sampling technique.

Data collection

The data was collected by structured questionnaire through interviews. The questionnaire was initially prepared in English and then translated into the local language (Afaraf). It was again translated back into English for checking consistencies.

Six female nurses, fluent speakers of the local language, were hired as data collectors. Two supervisors were selected from Samara University to check the completeness and consistency of the collected information. Data enumerators and supervisors were given a one-day training on procedures, techniques, and ways of collecting the data.

Data analysis

After data collection, the data was coded, entered, and cleaned on Epi Info version 3.5.4. Finally, it was exported to SPSS version 20 for further analysis. Frequencies and cross-tabulation were used for the descriptive analysis. Associations between factors affecting ANC utilization and independent variables were analysed. In the analytic statistics, both univariate and multivariate analyses were made; in the binomial analysis, explanatory variables having a p value less than or equal to 0.02, variables having association in crude odds ratio, and variables showing associations in published literature were taken to multinomial analysis.

Ethical consideration

Ethical approval was obtained from Samara University's ethical review committee. Written permission was given from the Afar Regional Health Bureau. Informed consent was obtained from the interviewee mothers after explaining the purpose and confidentiality of the data.

Limitations of the study

Since the questionnaire assessed the ANC service utilizations of mothers who had given birth up to two years preceding the survey, the time gap might have introduced recall bias.

Results

Socio-demographic characteristics

A total of 788 women who gave birth during the last two years preceding the survey were interviewed. Of these, 182 (23.1 %) were from Dubti town and 606 (76.92 %) were from the rural *kebeles* of Dubti district. Afar and Amhara were the dominant ethnic groups, constituting 671 (85.2 %) and 73 (9.3 %) women, respectively. The majority, 670 (85 %), were married, and 757 (96.1 %) were Muslim by religion. The minimum and maximum ages were 16 and 45 years, respectively, with a mean age of 29.9 years and SD of 6.3 years. The majority of the respondents were illiterate, 448 (56.9 %), and greater than half, 407 (51.6 %), of the study participants were pastoralists by livelihood. The minimum and maximum monthly incomes for the respondents were 100 and 3000 Ethiopian Birr (5 USD and 150 USD, respectively), respectively, with mean difference of 1182.67 ± SD of 772.4. The main source of information for 477 (60%) women was dissemination through the *dagu* system (cultural way of communication in Afar pastoralist society) (see Table 1).

Antenatal and delivery service utilization

The majority, 706 (89.6%) respondents, were multigravida (have more than one pregnancy), and 82 (10.4 %) were primigravida (women pregnant for the first time). From all respondents, 334 (42.4 %) had attended at least one ANC visit while only 65 (19.5 %) had made four or more visits. Out of those ANC attendees, only 58 (7.4 %) had delivered at a health institution with the support of skilled health professionals.

Lack of awareness, long distance of travelling, and lack of husbands' permission were major reasons for ANC non-attendance and home delivery. About 64.5 % of the total women interviewed lived at a distance more than 5 km away from a health facility, while 406 (51.5 %) of all home deliveries were assisted by trained traditional birth attendants (TTBAs) (See Table 2).

Determinants of ANC service utilization

ANC service utilization was found to have clear associations with residence (urban/rural), monthly income, service satisfaction, and proximity of health facility.

ANC utilization in urban areas was two times more than in rural areas, 95 % CI of 1.376, 3.595.

Women with monthly incomes of 1000 Ethiopian Birr (50 USD) and above were more likely to attend ANC

Table 1 Socio-demographic characteristics of respondents in Dubti District, Afar, February 2015

Characteristics	Number	Percent (%)
Residence (*N* = 788)		
Peri-urban	182	23.1
Rural	606	76.9
Age (*N* = 788)		
16 to 19	67	8.5
20 to 24	83	10.5
25 to 29	245	31.1
30 to 34	177	22.5
35 to 39	158	20.1
40 to 44	52	6.6
45 to 49	6	0.8
Mean + SD		29.9 ± 6.3
Ethnicity (*N* = 788)		
Afar	671	85.2
Amhara	73	9.3
Others	44	5.6
Religion (*N* = 788)		
Muslim	757	96.1
Christian	31	3.9
Education (*N* = 788)		
Illiterate	448	56.9
Primary and secondary school	327	41.5
College/university graduate	13	1.6
Marital status (*N* = 788)		
Married	670	85
Unmarried	118	15
Source of information (*N* = 788)		
Dagu	473	60.0
Health extension workers	432	54.8
Radio	266	33.8
Television	182	23.1
Others	17	2.2
Monthly income (*n* = 391)		
≤1000 Ethiopian Birr	212	54.2
>1000 Ethiopian Birr	179	45.8
Mean ± SD		1182.67 ± 772

Table 2 Determinants of ANC and delivery service in Dubti District, Afar, February 2015

Variables	Number	Percent (%)
Number of ANC visits (*n* = 334)		
Less than four visits	269	80.5
Four and above visits	65	19.5
Reasons for no ANC (*n* = 454)		
Lack of awareness	226	28.7
Distance of health institution	206	26.1
Lack of husband permission	104	13.2
Poor service satisfaction	80	10.2
Presence of male midwife	66	8.4
Lack of time	34	4.3
Costly service	19	2.4
Birth Assistant (*n* = 730)		
TTBAs	406	51.5
Family/relatives	198	25.1
Neighbour	105	13.2
Others	21	2.7
Reasons for home delivery (*n* = 730)		
Lack of awareness	390	49.5
Lack of transportation	314	39.8
Distance of health institution	230	29.2
Emergent labour	165	20.9
Unethical behaviour of health professionals	87	11.0
Presence of male professionals	104	13.2
Disbelieve in modern treatment	33	4.2
Other	34	4.3
Proximity (*N* = 788)		
≤5 km	280	35.5
≥5 km	508	64.5

than women whose monthly income was lower. Service satisfaction was found to be a strong obstetric predictor of ANC utilization, very closely associated with ANC utilization (adjusted odds ratio (AOR) = 3.184 and 95 % CI of 33.311, 119.85).

Multivariate analyses of being in urban residence (AOR = 2.224; 95 % CI 1.38, 3.60), and/or possessing radio/TV (AOR = 3.134; 95 % CI 2.204, 4.457), were positively associated with ANC utilization. Pastoralist women were less likely to use ANC services in comparison to women who were daily labourers (COR = 0.472 and 95 % CI of 0.288, 0.774) (see Table 3).

Maternal education was found to be a strong predictor for delivery place preference. Women who were college/university graduates were about five times more likely to give birth at health institutions than women with lower levels of education (AOR = 5.052; 95 % CI 1.184, 21,554).

The presence of male midwife in health institutes showed significant associations with increased home delivery at *p* value of 0.039 and AOR of 0.285 at 95 % CI (0.087, 0.937), while absence of drugs, unethical behaviour of health professionals, and short labour times were mentioned responses to increased home delivery.

Table 3 Determinants of ANC service utilization in Dubti District, Afar Region, February 2015

Background variables	ANC utilization		Crude OR (95% CI)	Adjusted OR (95% CI)	*p* value
	Yes	No			
Occupation					
Daily labourer	40	36	1.00		
Pastoralists	140	267	*0.472 (0.288, 0.774)*		0.003
Residence					
Urban	114	68	*2.941 (2.088, 4.145)*	*2.224 (1.376, 3.595)*	0.001
Rural	220	386	1.00	1.00	
Proximity to HF					
≤5 km	146	134	*1.855 (1.380, 2.493)*	*1.892 (1.385, 2.584)*	
>5 km	188	320	1.00	1.00	
Income range					
≤1000 Ethiopian Birr	105	107	1.00		
>1000 Ethiopian Birr	112	67	*1.703 (1.136, 2.554)*	*1.679 (1.104, 2.552)*	0.015
Source of information					
Possessing radio	118	148	*1.130 (0.838, 1.522)*	*1.336 (0.978, 0.826)*	0.000
Having TV	114	68	*2.941 (2.088, 4.145)*	*3.134 (2.204, 4.457)*	0.000
Dagu	185	287	1.00		
Satisfaction on the service provision					
Yes	228	15	11.914 *(28.747, 93.751)*	19.54 *(31.985, 110.83)*	0.000
No	65	222	1.00		

Discussion

According to the World Health Organization (WHO), every pregnant woman should receive at least four ANC visits. However, only 20 % (156) of women in our survey maintained the recommended standard. This finding is not consistent with the EDHS 2014 report, which showed that (32 %) women made four or more antenatal visits during the course of pregnancy, and increase from 19 % in 2011. In our study, 42.4 % of the mothers had less than the recommended visit, which is in line with the EDHS (2014) report.

About 40 % of interviewed women received ANC care from a skilled provider for their most recent birth. This is a noticeable increase from 34 % in 2011 (CSA 2014).

The prevalence of ANC use in this study was lower than 63.8 % found in a study done in another zone of Afar Region (Mekonnen et al. 2012). This difference might be due to changes in study design and sample size, and physical and financial access to a health facility has been addressed to a certain extent. The prevalence of ANC use in this study was also lower than 54 % found in a study done in Tigray Region, a non-pastoral region of Ethiopia (Tsegay et al. 2013). But this study is consistent with another study conducted in non-pastoral communities of northern Ethiopia which showed ANC attendance of 45 % (Abosse et al. 2010). ANC service utilization is significantly influenced by place of residence, proximity to health facility, monthly income, service satisfaction, and possessing a radio/TV. Women who reside in an urban area had two times more ANC visits than women from a rural and remote area with OR of 2.224 and 95 % CI of 1.376, 3.595. This study finding is compatible with EDHS (2014) findings.

Education has a direct impact on increasing ANC utilization; the better knowledge women have, the better their understanding and acceptance of the ANC service and the more likely they are to be users (Tura 2009). Most of the respondents in our survey recognized the maternal health service through the local d*agu* system, irrespective of their educational background. This therefore suggests that knowledge about ANC is not tied to formal education only. Thus, people could be educated through informal means such as the *dagu* system. It could be further argued that, though several other research studies have shown a positive influence of formal education on the utilization of ANC, our contrary results from this study could be due to how education was measured.

Possessing a radio or TV increased ANC use by more than 1.4 times and 3.2 times, respectively; this result is similar with the EDHS (2011) findings.

Women with higher incomes were more likely to receive specified maternal services than their counterparts. Monthly incomes of 1000 Ethiopian Birr (50 USD) and above increased ANC utilization by more than 1.7

times, consistent with the findings of other studies (Tsegay et al. 2013; EDHS 2014). This could be because better income increases ability to pay for health care services, transportation, and accommodation costs at health institutions.

One major outcome of ANC should be increasing the utilization of safe delivery services. From 42 % of the mothers who had made an ANC visit, only 7 % had an institutional delivery. This finding is slightly higher than the EDHS (2014) survey, where only 6 % skilled deliveries are recorded in the region, the lowest in the country. This calls for exploring the quality of ANC programmes and the role they are playing in planning delivery places. This study is consistent with findings of a study done in Dodota District, Oromia regional state (Fikre and Demissie 2012; Ahmed et al. 2010), but it is not consistent with a study done in Holeta town (Birmeta et al. 2013). Women's way of life was an important predictor for the utilization of ANC services, as pastoralist women were less likely to use ANC services.

Delivery service utilization

Home delivery is still a norm in many developing countries; maternal mortality tends to be highest where this is the case. In our study, 92.6 % of births took place at home compared with a study done in northwest Ethiopia (Worku et al. 2013) and the EDHS (2014) survey where home delivery was 86.2 % and 85 %, respectively.

Utilization of health services was influenced by pastoralists' perceived health needs, which are based on their beliefs, values, traditions, and seasonal movements. Pastoralists move long distances with their livestock, searching for water and pasture. Delivery of health care services through mobile clinics is recognized as the best way to provide care to continuously moving pastoralist communities. Mobile clinics may be more cost-effective than fixed facilities. Pastoralist women fear male midwives touching their reproductive organs; in our study, about 16 % of women did not attend delivery in a health facility due to abhorring being attended to by a male midwife. A male midwife in the labour unit was 3.5 times significantly shown to decrease prevalence of institutional delivery having AOR of 3.504 and 95 % CI of 1.067, 11.505. This finding is supported by a qualitative study done in Afar Region in which a woman said, "It is only God and my husband who have the right to see me naked. It is really impolite (culturally) and unacceptable in Afar to expose the reproductive health organs" (Yousuf et al. 2011).

Conclusions and recommendation

Utilization of maternal health services by pastoralists of Afar is extremely low according to recommendations for safe motherhood. Use is affected by lack of awareness, cultural beliefs, seasonal mobility, and limited availability of health facilities and health staff, all crucial factors that restrict pastoralist women's access to health care services. Maternal mortality and morbidity among pastoralists can be reduced by enhancing equitable access to community-based promotive, preventive, and selected curative health care interventions. Maternity or birth waiting homes should be targeted to overcome geographical barriers and transport problems for women to access maternal health care services in rural and remote pastoralist areas. The government should strengthen health extension workers' training programmes and pastoralist mobile-clinic approaches, to be more suited to the pastoralists' way of life. The regional government should give special support to distribute human and financial resources for remote pastoralist women. Pastoralist social networks for women should be established, to promote utilization of services and empower pastoralist women. Health awareness campaigns should be conducted to raise pastoralist women's awareness about safe maternal health issues. An advocacy group comprising tribal, religious, and community leaders should be established, to advocate for better utilization of maternal health care services. Women's empowerment through education, involvement in behavioural change activities, and cultural influences (i.e. not being treated by a male midwife) should be assessed by qualitative studies.

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Authors' contributions

Both authors (NB and HM) contributed to the design of the study and the interpretation of data. NB performed the data analysis and drafted the manuscript. HM critically revised the draft manuscript, and both authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

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